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THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

REPORT FOR 1920

(WITH BALANCE-SHEET FOR 1919)

BY THE

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G. CLARIDGE DRUCE, LL.D.,

TREASURER AND EX-PRESIDENT OF THE ASHMOLEAN NATURAL
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(VOL. VI. PART I.).

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BY THE

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G. CLARIDGE DRUCE,

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THE REPORT OF THE SECRETARY & TREASURER

G. CLARIDGE DRUCE, YARDLEY LODGE, OXFORD,

FOR 1920.

BALANCE-SHEET FOR 1919.

Subscriptions received, -	£119	18	0	Balance due from 1918, -	£5	1	3
Sales of Reports and Advertisements, - -	18	3	6	Printing Reports, &c., -	137	12	6
Balance due to Treasurer,	24	6	5	Expenses of Distribution,	2	15	6
				Postages, Carriages, Stationery, &c., - - - -	16	18	8
	£162	7	11		£162	7	11

Life Members' Fund, £55 7s : invested (at cost), £35 ; in hand, £20 7s.

Audited and found correct, January 26, 1920.—F. TWINING.

All subscriptions should be paid to the above address on the first of January each year or to the account of G. C. Druce in the London County, Westminster and Parr's Bank, Oxford Branch. Payment in advance for two or more years saves much trouble and expense. Ordinary Member's Subscription, 10/-; Exchange Member's Subscription, 12/6; Entrance Fee, 5/-.

A necessary increase of the price of the subscription, caused by the heavy increase in the cost of printing, paper and postage, has had to be made. As it is, the subscription barely covers the cost of production and there is much leeway to overtake. The Supplement on "The Dubious Plants of Britain," which appeared in last *Report*, was costly and ought to have been held over, but as it was in type it was included. This caused a heavy deficit. Strong pressure has been made to bring out interim Reports, but under the present conditions such a course must be postponed.

The increase in the Subscription—much as I disliked and tried to avoid it—has been readily accepted by our members—so inured are we to sacrifice. It was evident that a Report of the magnitude of our own could not be produced at anything like a five-shilling subscription.

We have to thank Mr J. Walter White and Miss Roper for distributing the 7400 specimens sent in, and for editing the Distributor's Report for 1919. We have also to thank Mr White for kindly supplying members with so many of his beautifully prepared and selected specimens.

The year 1920 was by no means a good one for the botanist. The season was not genial nor, despite the rain, was it favourable for Carices or Grasses, which I have rarely seen in a worse condition on the Scottish hills. The members, however, have been industrious, and I have had the advantage of seeing and assisting to name many thousands of plants. I would ask members to help by sending me well-selected specimens, to which should be tied a small label bearing a number identical with that appended to the plant and retained by the member. It becomes increasingly impossible to return specimens. The greatest care should be taken to see that the specimen sent is the same and bears the same number as that retained. The label sent should have the date, the habitat, the county, &c., on it.

Among the discoveries of the year may be mentioned *Plantago Cynops*, which was discovered in 1902 by Mr C. E. Britton in Kent, on ground now brought under the plough, but re-found this year by a little girl, a protégée of our member, Miss Ridley, under whose auspices Mrs Wedgwood and I saw it in November. It grows in a wild-looking situation. Another good find was that of *Sonchus palustris* in Norfolk by our member, Mr A. Graveson. Its rediscovery in that county gives hope that the Fen Ragworts may yet be re-found. Our members, Mr J. F. Rayner and Mrs Godden have found *Illecebrum verticillatum* in S. Hants and Kent respectively, a notable extension of its range. In company with Prebendary Burdon and Colonel Johnston I was lucky enough to dredge up *Nitella nidifica* in the Loch of Stenness, Orkney, last August. Its only previous record in our islands was an over-ripe specimen found by the Rev. E. S. Marshall in the lagoon north of Wexford Harbour, but it was too poor to figure. In the far distant

Orkneys, it was in good condition and was accompanied by *Chara canescens*, only previously known from Wexford and the south of England. Both these were new to Scotland. In the Shetlands, Prebendary Burdon and myself were successful in gathering *Potamogeton rutilus* (only known previously from Anglesey) and *P. panormitanus*, both new to Shetland. On Cairngorm at over 3000 feet, Mrs Wedgwood and I gathered *Taraxacum croceum*, not hitherto recorded for Britain. It was gathered by me in 1919, and confirmed this year. Among other new Dandelions *Taraxacum naevosum*, which belongs to the Spectabilia, was found in Berkshire. It is a remarkably handsome species. In the canal near Lichfield, Staffordshire, Sir Roger Curtis and I gathered *Potamogeton Lintoni* in its second British locality. As will be seen, a Marsh Orchid has been named *O. purpurella* by our members, the Rev. T. and Mr Stephenson. It may be the *cruenta* of Mueller. A very unexpected record is that of *Lathyrus niger* from a Warwickshire wood. It was seen there in 1913, but our repeated search for it this year proved fruitless.

A specially interesting feature of the year has been the completion of some cultural experiments on the Shepherd's Purse by Dr Almquist, whose laborious research on the subject has already appeared in the *Act. Hort. Berg.*, 1907. The present paper is supplementary to that, and it is pleasing to see that we have in Britain several additional forms.

We offer our sincere congratulations to our members, Mr James Groves and the Rev. Canon Bullock-Webster, on the appearance of the British Charophyta, issued by the Ray Society. This will have permanent value and is a work of which they may be justly proud. It is hoped we may soon see the second and concluding volume. We are also pleased to see the useful volume on the *Flora of Chepstow* by our old member, Dr W. A. Shoolbred. Mr A. R. Horwood has also published a practical volume, " The Outdoor Botanist." The third volume (but second published) of the *Cambridge Flora* has also appeared. This volume, following Engler's system, describes the plants from *Montia* to *Fumaria*, the latter genus being ably written by Mr Pugsley.

Our congratulations are also offered to Dr Craib on his appointment to the Chair of Botany at Aberdeen University, and to Prof. Balfour on receiving the K.B.E.

1920 has taken a sad toll. We have to deplore the loss of our old Secretary and Honorary Member, the kind-hearted J. Gilbert Baker; that skilful septuagenarian plant limner, A. Montgomery Bell; our *Rubus* specialist, the Rev. W. Moyle Rogers, full of years, who may be said to have remodelled our Bramble arrangement, and who diagnosed many new species and varieties, but only after meticulous care and always with a mind free enough from self-consciousness to reconsider his view under criticism, and to modify his opinions when he—and it was by no means a superhuman task—was convinced they could be improved. Mr H. Messel died prematurely in the summer. He was a botanist who, one had hoped, might have done much for our science. Dr H. J. Clarke, the accurate painter of flowers, passed suddenly from us at his Buckinghamshire home. We also deeply regret the loss of that brilliant writer and adventurous traveller, Reginald Farrer, who died from diphtheria under alien skies in far distant Burma, when his life had hardly begun.

We have secured for our next Distribution, the services of Miss E. N. Miles Thomas, D.Sc., Keeper of the Department of Botany at Cardiff, Miss Vachell and Mr A. E. Wade. Parcels should be sent before December 1, to the Department of Botany, 35 Park Place, Cardiff.

We are under great obligations to the Rev. F. Bennett, Mr C. E. Britton, Mr and Mrs Corstorphine, Mr D. Lumb, and Mr W. H. Pearsall for literary assistance, and to Mr T. Gambier Parry, who has also kindly supplied the Dioscoridean photograph of the Shepherd's Purse.

Could a few more of our active members not take up the study of some of the critical genera? We have already Mr Pearsall working at the Pondweeds and Batrachian Ranunculi; Mr Pugsley, on *Fumaria*, &c.; Mrs Gregory, on the Violets; Dr Drabble, on the Pansies; Mr Bucknall, Dr Drabble and Mr Lumb, on the Eyebrights; F. N. Williams, on *Sagina*; Lieut.-Col. Wolley-Dod, on Roses; Mr J. Wheldon, on *Centaurium*; Mr A. B. Jackson, on *Barbarea;* Mr Turrill, on *Glechoma*; Rev. H. J. Riddelsdell, on Brambles; Drs Salisbury and Moss, on *Salicornia*; Mr C. E. Salmon, on *Limonium*;

Mr C. E. Britton, on *Centaurea*; Mr Groves and Canon Bullock-Webster, on Charas. There are, however, such genera as *Thalictrum*, *Myosotis*, *Mentha*, *Thymus*, *Orobanche*, *Juncus*, *Spergularia*, and *Erophila* which are inadequately worked out. A large number of our varieties require verification. A fresh study of the Hieracia is sadly needed by one who has not only the power to differentiate but the ability to group. I am always glad to see Orchids and Hawthorns, and can obtain continental assistance for Cow-wheats, Shepherd's Purse, Goosefoots, and Cruciferae.

Our new members include :—The Hon. Mrs Adeane, J. H. Adams, Miss Gertrude Bacon, the Hon. Agatha Beaumont, Viscount Bryce, Mrs Cadbury, Lieut. J. A. Codrington, Miss Claridge, Reginald Cory, Miss Cottes, Mrs Debenham, Mrs Dent, W. S. M. D'Urban, Mrs Patrick Ewing, J. Farrer, J. R. Foggitt, A. W. Graveson, B.A., Mrs Godden, C. H. Grinling, M.A., W. E. Groves, Sir H. C. Hawley, Bart., Rev. G. H. Harris, M.A., Miss Hillard, Robt. Hellon, W. H. Jones, Prof. F. W. Keeble, C.B.E., F.R.S., Rev. J. de C. Laffan, Miss Landon, B.Sc., Lord Leverhulme, J. R. Matthews, M.A., F.L.S., W. Miller, Rev. Alan C. Morris, M.A., George Morgan, Miss Noel, Lady Osler, H. Page, Donald Patton, M.A., B.Sc., Major E. Savile Peck, M.A., Prof. R. W. Phillips, D.Sc., Miss Pomeroy, Prof. J. H. Priestly, B.Sc., Alex. F. Roberts, Mrs Russurim, T. Edmondston Saxby, R.W.O., F.R.P.S., W. F. E. Seeley, A. W. Stelfox, Prof. J. Small, M.A., W. R. Sherrin, G. E. Stechert, Miss Muriel Shepherd, J. H. Stephens, E. W. Swainton, Mrs Thompson, C. H. Toke, T. J. Wall, W. Watson, Mrs Wedgwood, J. G. Wilkinson, Miss Ethel M. Williams.

PLANT NOTES, Etc., for 1920.

(*Mostly New Plants to the British Isles*).

9. Anemone nemorosa L. A form with narrower, more strap-shaped sepals at Weston Birt, Gloster, shown me by Lady Holford in 1920.

47. Ranunculus Ficaria L. Some further Notes and Observations, 1917-19. A paper read by A. A. Dallman before the Liverpool Botanical Society in September 1919. Notes on the Phenology and Variation. It was stated that small leaves were observed in Curzon Park, Dingle, Chester, on December 3, 1917. The indication of a monocotyledonous affinity is mentioned as being also evidenced in *Anemone nemorosa* L.

80. Papaver Rhoeas L. Mr E. B. Bishop sent a plant from his garden at Godalming where *Rhoeas*, *dubium* and *orientale* grow together. He thought it was a hybrid of *Rhoeas* with *orientale*. Dr Albert Thellung names it *P. Rhoeas* L., var. *strigosum* Boenng. The leaf-outline, the appressed stem-hairs and the very slightly longer capsule suggest to me a possible *P. Rhoeas* × *dubium*. The petals, however, are strongly blotched with black at the base. G. C. Druce.

98 (2). Bikukulla eximia (DC.) Druce. *Diclytra eximia* DC. *Dicentra eximia* Torrey. Alien, North America. Dartley Water Works, near Glasgow, R. Grierson. Doubtless planted.

126. Radicula islandica Druce, var. microcarpa Britton in Rep. B.E.C. 806, 1919. West Barnes, Merton, Surrey. [Ref. No. 2162.] Differs from the type in its shorter and stouter pods, each with a more prominent style. C. E. Britton.

140. Arabis petraea Lam., var. glabra Edmondston Fl. Shetl.

25, 1845. See *Rep. B.E.C.* 495, 1910. This plant is scattered over the serpentine at Balta Sound, Unst, and perennates in a curious way. It sends down a stoutish root from its dense rosette of glabrous, rigid leaves, and this penetrates the soil laterally, sending up at intervals, sometimes at the distance of 6 inches, a small branch which ascends to form on the surface soil a rosette. At another 6 inches the process is repeated so that in one instance I was unable to unearth the plant which spread more than two feet. The flowers are often suffused with lilac or purplish-lilac. The stems are not entirely leafless except in young specimens. G. C. DRUCE.

142. CARDAMINE PRATENSIS L., var. UNIFLORA Sternb. & Hoppe. Braemar, S. Aberdeen, 1844, H. C. WATSON, and recently described from Rudgwick, Sussex, by W. B. TURRILL in *Kew Bulletin* 6, 1920. It is a lusus rather than a true variety.

193 (2). SISYMBRIUM PULCHELLIMUM comb. nov. *Descurainea pulchellima* Muschler in Engl. Bot. Jahr. xlix., 2, 200, 1913. Alien, Bolivia, Argentina. This is the plant, queried as *Sisymbrium myriophyllum* Willd. in the *Adventive Flora of Tweedside* 9, gathered by Miss I. M. Hayward in Selkirkshire in 1913 and 1916.

193 (3). S. BURCHELLII DC. Under this, as a variety, may be placed *S. Turczaninowii* of Sonder (see *Adv. Fl. Tweedside* 7). It is a native of South Africa. G. C. DRUCE.

219. BRASSICA DISSECTA Lag., var. SETOSA (Degen.). Port Talbot Docks, Glamorgan, 1910, H. J. RIDDELSDELL, teste THELLUNG, who puts it under *Sinapis alba*, sub-sp. *dissecta* (Lag.) Bonnier, var. *setosa* Degen.

284 (2). RESEDA INODORA Reichb. Alien, Hungary and Eastern Europe. Possil, Lanark, R. GRIERSON. See *Rep. B.E.C.* 720, 1919.

Gen. 79 (2). ASTROCARPUS Neck. Elem. ii., 243, 1790.

286 (10). A. SESAMOIDES DC., ex Duby Bot. Gall. i., 67. Alien, Spain, France. St Philip's, Bristol, CECIL & NOEL SANDWITH.

288. HELIANTHEMUM CHAMAECISTUS Mill., var. PARVIFLORUM

Druce in Ann. Scot. Nat. Hist. 98, 1911, and Rep. B.E.C. 10, 1911. This was gathered at Elibank, Peebles, and Wychwood, Oxford. Prof. I. B. Balfour gave me a root which came from a plant gathered in Caenlochan, Forfar, in 1918. It retains its characters in cultivation. G. C. DRUCE.

352. SILENE LAETA A. Br. in Flora 373, 1843. Alien, Leith Docks, September 19, 1920, coll. et det. JAMES FRASER. A native of France, Spain, Portugal, Italy, Corsica, Sardinia, Tunis, Algeria, Marocco. Williams omits it from the genus *Silene.* Nyman places it in *Eudianthe*, which Bentham and Hooker merge into *Lychnis*, under which it was first described by Aiton in Hort. Kew. ii., 218, 1789, as *Lychnis laeta.* Afterwards Brotéro (Fl. Lusit. ii., 221, 1804) called it *Lychnis palustris*, George Don (Gen. Hist. i., 116, 1831) *Argostemma laeta*, and Fenzl, in Engler's Gen. Suppl. ii., 1842, *Eudianthe laeta.* The *Kew Index* and Rouy & Foucaud *Fl. Fr.* put it in *Silene*, under which it appears in the *Plant List.* It is probably one of the Esparto introductions from the Algerian coast, since *Bellis annua*, *Hypochoeris aetnensis*, *Aira provincialis*, *Aira Cupaniana* and *Agrostis pallida* were also detected by Mr Fraser in the same locality.

454. MALVA PUSILLA With. and 456. M. PARVIFLORA L. Mr J. E. Little tells me that in discriminating these two allied species he finds that they differ in habit and that the best herbarium character is that in *pusilla* the bracts of the epicalyx are broader and exceed the flowering calyx, while in *parviflora* they are narrow and fall short of it. The flowers in the latter are nearly sessile, and the main stem is erect and very stout.

457 (2). M. HISPANICA L. Alien, Spain, Portugal. In cultivated ground, once manured with shoddy waste, Pyrford, Surrey, October 1920, G. C. DRUCE & Lady DAVY.

464. TILIA EUROPAEA L., lusus CANDIDA (Augustine Henry in Gard. Chron. ii., 180, 1920), as *T. vulgaris*, var. *candida.* A single branch, 6½ inches in girth, grows on an old tree at The Down, Athlone, having all or nearly all the leaves white.

474. × GERANIUM HYBRIDUM. Under this name there is a note by "S. A." in *Gard. Chron.* ii., 241, 1920, which describes a hybrid of *G. sanguineum* × var. *lancastriense.* It was found on Walney Island. It is said to have the dwarfness of *lancastriense* but the colour is nearly that of *sanguineum.* Some years ago Reginald Farrer and I saw a hybrid of this origin growing with both the putative parents. It differs from *prostratum* in that the petals have the delicate lines which are present in *lancastriense* although the ground colour is different. Farrer cultivated it at Ingleborough. G. C. DRUCE.

481. G. PYRENAICUM Burm. f., forma PALLIDA. In a sandy lane near Eridge, Sussex, a patch of plants extending over several yards, E. G. TALBOT. Differs from the type in its pale, flesh-coloured petals. G. C. DRUCE.

497. ERODIUM CICUTARIUM Ait. E. G. Baker and C. E. Salmon contribute a valuable paper on the maritime forms to the *Journal of Botany* 121, 1920, in which are described *E. glutinosum* Dumort., *E. neglectum* Baker & Salm., *E. Lebelii* Jord. and *E. Ballii* Jord., the last presumably from Ireland but requires refinding. The *glandulosum* Bosch., first given for England by A. Bennett, seems to be mainly the *glutinosum* Dum. and the *neglectum* now described, which may displace it.

519. RHAMNUS CATHARTICUS L. Near Thetford, W. Norfolk with dioecious flowers, Misses COBBE.

537. ULEX EUROPAEUS L. La Moye, Jersey, April 1920. This year, in Jersey, the Gorse was exceptionally full of flower and it afforded a wonderful sight. As depicted in the *E.B.* plate, t. 742, the standard is distinctly notched, and this form is by far the commoner plant. Growing on La Moye Common there were, however, a few bushes in which the flowers had entire standards, a form hitherto unobserved by me. G. C. DRUCE.

537. U. EUROPAEUS L. × GALLII Planch., nov. hybr. Parkhurst Forest, Isle of Wight, May 1920. In company with Sir James and Lady Douie I noticed on the border of some of the rides in this

interesting piece of woodland a Gorse in flower which had the small spines of *Gallii* but the more shaggy and paler calyx of *europaeus*. Its habit was that of a tall, slender plant. I could see none of last year's fruits. It recalled a somewhat similar plant, also flowering in May, which I saw at Millook, Cornwall, some years ago, which is also, I believe, a hybrid of the above species. The vegetative parts resemble *Gallii*. The primary spines were almost straight and were only 20 mm. long, those of *europaeus*, in the vicinity, being 40 mm. long, and the whole plant was much more ferocious. The flowers are a little smaller and paler than those of *europaeus*, but the wings are not longer than the keel, the standard is deeply notched, and the calyx more hairy with longer hairs than in *Gallii*. Rouy & Foucaud (*Fl. Fr.* ix., 241) describe a var. *humilior* of *europaeus* but the Parkhurst plant is tall and seems to possess intermediate characters. I suggest the above as a probable parentage. G. C. DRUCE.

549 (2). TRIGONELLA STRIATA L. f. Suppl., 52. Alien, Serbia, etc. Leith, Midlothian, 1920, J. FRASER.

586. MEDICAGO LUPULINA L., var. UNGUICULATA Reichb. Guestling, Sussex, H. REDGROVE and Rev. A. G. GREGOR. An analagous condition to the same named vars. of *Melilotus officinalis* and *alba*, in which the corolla becomes leafy. Is a mite the cause?

595. MELILOTUS ALBA Desr. Under the name of Sweet Clover the United States Dept. of Agriculture, Bulletin n. 844, 1920, publishes a paper by Mr H. S. Coe & Prof. J. N. Martin on " Pollination Studies of Seed Production and the Structure and Chemical Nature of the Seed-coat and its Relation to Impermeable Seeds of Sweet Clover." This paper is a valuable contribution to our knowledge of the fertilisation of *M. alba*. There are good diagrams and careful experiments have been made which show that although *M. alba* can produce seed by self-fertilisation yet it is so rarely done that only less than one per cent. of them set seeds without being pollinated by insects. A list of insect visitors is given. In order to produce a good crop of seed a considerable quantity of water must be present in the soil, the yield being diminished by nearly 50 per cent. in dry conditions. With regard to the impermeability of the

seed-coat it was found that soaking them for 15 minutes in concentrated sulphuric acid (s.g. 1.84) renders the coats permeable. This probably explains the ready germination of so many of the seeds of wool aliens after treatment with sulphuric acid. An extensive bibliography of works cited is appended. The wonderful output of practical as well as scientific papers from the Department fills a Britisher with envy. The Inventory of Seeds and Plants imported (July 12, 1920), extending to 96 pages, includes and figures a Venezuelan vegetable, *Arracacia xanthorrhiza* Bancr., an Umbelliferous species growing only at 4000 ft. and upwards on the Andes. The root, which I tasted at Caracas, is like a parsnip. A Javanese shrub, *Pavetta Zimmermanniana*, is mentioned which has its leaves inhabited by bacterial colonies which induce knots analagous to those formed by *Bacillus radicicola* in the roots of leguminous plants.

700. VICIA LATHYROIDES L., forma ROBUSTA. Sandhills, Southport, S.W. Lancashire, 1891, C. BAILEY; Hommet Bonnet, Guernsey, May 1920, Mrs WEDGWOOD. Differs from the common plant in its larger size—3 dcm.; in its larger leaflets—17 mm.; and larger pods, up to 30 mm. long.

711. LATHYRUS PRATENSIS L., forma SPECIOSA mihi. The common form of the Tingwall area and elsewhere on the Mainland of Shetland and also near Balta and Burrafirth, Unst, July-August 1920. This differs from the usual British plant in the much larger flowers, measuring 16-20 mm. against 12-16 mm. in the English plant, and not only are they longer but they are larger and on an average there is a greater number of flowers in the inflorescence, *i.e.*, 8-10 as against 6-9. The plant, on the contrary, is of lower growth. This larger corolla is not limited in Shetland to *Lathyrus*, but also obtains in *Trifolium pratense*, *T. repens*, *Vicia Cracca* and *Lychnis dioica* as well as sometimes in the ligulate flowers of *Achillea Ptarmica*. This may arise from the larger number of hours the sun is above the horizon during its flowering period, since these plants appear indifferent to edaphic or soil factors. G. C. DRUCE.

730. L. NIGER Bernh. This is one of our rarest species. It was first recorded in Britain from the Den of Airlie, Forfarshire, in

the *Flora Scotica* (part 2) 267, 1821, by Sir William Hooker in these terms :—" Mr [Thomas] Drummond has had the good fortune to discover it, truly wild, at Airlie, ten miles west of Forfar." It is not included in part 1, which of course is of an earlier date and in which the plants are arranged according to the Linnean system. Drummond's specimen from this locality is in *Herb. Edin.*, and there is another, dated 1827, from Walker-Arnott. It was recorded from Killiecrankie, Perth. by W. Gorrie, about 1839. I collected it in 1878 when it was on its last legs, so I took no root. White saw it there in 1892. A third locality is given by Syme (*E. B.* iii., 112), Craiganain, a rock within 2 miles of Moy House, Inverness-shire. This is mentioned in Anderson's *Guide to the Highlands and Islands of Scotland* 400, 1834, where it adds that several attempts to find it have failed and, I think in a subsequent edition. it suggests the probable explanation that it had been mistaken for the common *L. montanus.* I am not aware of any specimens from this locality, and Prof. Sir I. B. Balfour tells me there are none in the Edinburgh herbarium. A fourth locality is that of Roddam Dene, Northumberland, where it was said to have been gathered by Mr Tate in 1852 (Johnston's *Nat. Hist. Eastern Borders* 571, 1873, where it is stated to be a garden escape). As a naturalised plant it was found by the Rev. E. S. Marshall in Sussex, where it was doubtless planted. The indigenity of the plant in any of these localities is open to question. Don, that lynx-eyed and indefatigable worker at the Forfar flora, does not mention it, although he knew the Den of Airlie well. That picturesque den is adjacent to Airlie Castle, and it is more than probable that the *Lathyrus* was planted there. The place now seems to know it no more. I have searched it two or three times in vain. In Killiecrankie it was limited to a small area not far from cottages, and one of the cottagers supplied specimens at 1s a piece. It is now eradicated. The record for Moy has never been confirmed unless indeed a cryptic note may refer to this locality :—" *Orobus niger.* Nr. Lake Nevis, June 13, 1836," which is attached to a specimen in the Edinburgh Herbarium, possibly in the hand of W. C. Trevelyan. This, however, may be a distinct and additional locality, which awaits verification. The geographical distribution in Europe favours its being a native of

Britain. Rouy & Fouc. (*Fl. Fr.* v., 272) say "presque toute l'Europe (excl. rég. boréales)." In France it grows in "bois montagneux surtout calcaires, mais peu commun, dans presque toute la France." This suggests that the hilly woods of Hereford, Gloster and Somerset may be likely places. I now come to a more recent record. This summer, Mr Bolton King sent me a specimen which was gathered, he says, in the summer of 1913 by Mr W. F. E. Seeley in a hilly wood near Southam, in Warwickshire, where he saw it in some quantity. The specimen was correctly named. In company with the finder, Mr Bolton King and Mr Groves we made a careful search, but it was unsuccessful. In the seven years' interval the wood, which consists of aboriginal vegetation, had much grown up and our failure to re-discover it may have been due to this cause. A second visit to the area mentioned by the finder was equally unsuccessful. That it was found here, and probably as a native plant, is practically certain. The specimen was labelled by Mr Seeley at the time. Its re-discovery in this place would give it a higher claim for citizenship than any of the preceding records.

745 (4). SPIRAEA CANESCENS Don. Naturalised in a wood below Cansand Beacon, Devon, 1919. H. E. Fox in *Rep. B.E.C.* 814. 1919.

901. POTENTILLA REPTANS L., flore pleno. Near Calne, Wilts. Mrs COLVILLE and Lady DAVY. The inflorescence is showy from the many rows of petals.

925. ROSA STYLOSA Desv., var. PTYCHOPHYLLA Boulenger in Journal of Botany 16, 1920. Studland, Dorset, G. A. BOULENGER.

927. R. DUMALIS Bechst., var. OBLONGA. *R. canina*, var. *oblonga* Boulenger, *l.c.* Studland, Dorset.

931. R. CALOPHYLLA Christ. Hedge Harp fields, between Tenbury and Greete, Salop, 1892, C. BAILEY, as *R. frondosa* Baker.

936. R. MICRANTHA Sm., var. LUSSERI Lag. & Puget. Between Studland and Corfe Castle, G. A. BOULENGER, in Journal of Botany 21, 1920.

941 *g* R. BRITANNICA Déségl. Dr G. A. BOULENGER, in Journal of Botany 185, 1920, suggests that this name should be applied to a Rose which has been variously named *foetida* Bast., non Herrm., *Jundzilliana* Baker, non Besser, &c. He gives a description based on living material from Oxted and Limpsfield, Surrey. Wolley-Dod has already adopted the name which also appears in my *List* as var. g. of the aggregate *mollissima* Willd.

969 (5). CRATAEGUS CRENULATUS Roxb. Fl. Ind. ii., 509. Alien, India. Abbot's Wood, near Polegate, Sussex. ? Bird-sown or planted. Coll. T. A. DYMES and E. BEDFORD. It is the *Pyracantha crenulata* M. Roem. One bush grew in a sandy field, another in the wood itself.

1007. COTYLEDON UMBILICUS-VENERIS L. At St Brelade's, Jersey, some immature, strongly bracteate plants simulated *C. lutea*. This may be the origin of the erroneous record of *C. lutea* for Somersetshire. G. C. DRUCE.

1026 (2). SEMPERVIVUM ARBOREUM L. (DC. Pl. grasses ii., t. 125). Alien, S. Europe—Portugal, Spain, &c. Naturalised at Gibraltar, &c. On the cliffs of a quarry near St Catherine's, Jersey, quite naturalised. It grows high up on the sheer quarry walls, above 70 feet altitude. There is no house above the cliff, nor is it easy to suggest how the plant became introduced. At a distance it suggested a clump of some yellow Crucifer. My companion, T. Churchill, a boy of 12, succeeded in reaching it and threw some pieces down, which enabled me to recognise it as an old Gibraltar friend. G. C. DRUCE.

1133. OENANTHE FLUVIATILIS Colem. This plant has been much misunderstood by continental botanists owing to its extreme scarcity in Europe. Dr Albert Thellung is now monographing the Umbelliferae and in answer to his request I sent him ripe fruits and a statement of my experience of its distinctness as evinced by the seedlings, the submerged leaves, &c. He replies that an examination of the fruits shows that they differ from those of *aquatica* and *conoidea* "par le développement de côtes secondaires (sur les vallicules) aussi grandes que les côtes primaires. C'est là une raison de plus pour séparer spécifiquement l'*OE. fluviatilis.*"

1134. Œ. CROCATA L. Juice from the green herb found not to be poisonous to cattle in Wexford. See note by C. B. Moffat in *Irish Nat.* 13, 1920.

1147. ANGELICA SYLVESTRIS L. A polymorphic species, probably including several races. Two main groups of forms may be distinguished according to the character of the terminal leaflets, whether these are distinct at the base, or decurrent upon the petiolules. Fischer in *Cat. horti Petrop.* 1842 divides the species into var. *vulgaris* characterised as "pinnulis non decurrentibus, terminalibus fere petiolulatis," and var. *decurrens* diagnosed as "pinnulis, saltem summis, decurrentibus, terminalibus saepe sessilibus." For the first of these, Fischer quotes *English Botany* t. 1128. The second variety has received several names. It is the *A. sylvestris*, var. *elatior* Wahlenb., and, as a species, *A. montana* Schleich. Fischer also referred to it as *A. sylvestris*, var. *litoralis* Hartm. and *Imperatoria flavescens* Bess. When the decurrent feature of the upper leaflets is well-marked it is strikingly different from the more familiar form of *Angelica*, but intermediates connect the two varieties.

Var. VULGARIS Fischer. Isle of Wight (*Herb S. Lond. Bot. Ins.*); W. Kent: Downe (*Herb. S. Lond. Bot. Ins.*); Surrey: copse near Claygate (C.E.B.); Gatton Park (W. H. Beeby, *Herb. Brit. Mus.*); Berks: Sunninghill (*Herb. Banks*) and near Childswell Farm (*Herb. Druce*); Herts: Welwyn (*Herb. Druce*); Northants: Plumpton Wood (*Herb. Druce*); Oxon: Sibstone (*Herb. Druce*); N. Staffs: between Trentham and Clayton (*Herb. Brit. Mus.*); Lake Lancs: near Mansriggs (*Herb. Brit. Mus.*); Jersey: St Peter's Valley (*Herb. Druce*).

Var. DECURRENS Fischer. Cornwall: near Sandplace (*Herb. S. Lond. Bot. Ins.*); W. Kent: Keston (*Herb. Brit. Mus.*) and Shortlands; Surrey: the common form by the R. Thames above London—Mortlake, Kew, etc. (C.E.B.), R. Wey below Guildford (*Herb. Brit. Mus.*); Middlesex: Stanmore (*Herb. Druce*); Northants: Nobottle (*Herb. Druce*); Suffolk: Oakley Park (*Herb. Brit. Mus.*); York: Thrybergh (*Herb. S. Lond. Bot. Ins.*). Scotland.—Fife: N. Queensferry (*Herb. Brit. Mus.*); Forfar: Caenlochan (*Herb. Druce*);

Shetlands (*Herb. Brit. Mus.*). Ireland.—Donegal (*Herb. Brit. Mus.*). C. E. BRITTON.

1220 (2). KENTRANTHUS MACROSIPHON Boiss. Diagn. ser. 1, iii., 57. Alien, Southern Spain. St Ouen's Bay, Jersey, 1901, J. Piquet as *Valeriana pyrenaica*, collected by Mr DONCASTER, ex *Hb. Piquet.*

1224. VALERIANELLA DENTATA Poll. Handcross, Sussex. A curious fascicled form which Mr Swanston thinks is caused by the Hemiptera, *Trioza centranthi* Vallot. The specimens were communicated by Mrs Graham.

1248 (2). BELLIS ANNUA L. Alien, S. Europe. In abundance at Leith Docks, Midlothian, J. FRASER & R. GRIERSON.

1268 (2). FILAGO ARVENSIS L. Alien, Central and S. Europe, W. Asia, Siberia, Canaries. Levenhall, Midlothian, 1916, with the var. *lagopus* DC. Prod. vi., 249, which differs from the type in its greater woolliness. J. FRASER.

1274. GNAPHALIUM ULIGINOSUM L., var. PROSTRATUM Huet, ex Nym. Consp. 382. See *Bull. Soc. Bot. Ital.* 60, 1900. Plants coming under this occurred on light sandy soil near Midhurst, W. Sussex, June 1920, G. C. DRUCE.

1294. XANTHIUM STRUMARIUM L. Under the name Cocklebur. A. A. Hansen in Circular 109, July 1920, of the United States Dept. of Agriculture, gives a description and the means used for the eradication of these troublesome pests to the sheep-farmer. He says there are about a dozen native species in the United States most of them resembling *Strumarium*, × *spinosum* standing apart. The seeds contain a valuable fixed oil which can be used as human food. The ever ingenious American has used the Burs "in the manufacture of advertising novelties." "They are burs, they will stick," but will also distribute a growing danger to agriculturists.

1311 (5). BIDENS PROCERA D.Don in Bot. Register t. 684.

Alien. Mexico, Arizona. Hortal. Marston brick-yards, Oxon, October 1915, G. C. DRUCE.

1333 (2). ACHILLEA MICRANTHA Willd. Adventive in France, Germany, etc. Native in Asia austr.-occ. Differt ab *A. tomentosa* foliis planioribus, laciniis multo angustioribus, apice minus cartilaginosis, caule brevius pubescente (nec partim lanoso-villoso), involucro subglabro. Det. by A. THELLUNG from near Derby, 1871, Mr MEDLEY, who had named it *A. tomentosa*.

1393. SENECIO AQUATICUS Hudson, var. (vel forma) ORNATUS mihi. In July last when entering the harbour of Lerwick one was anxiously trying to identify the first plant of Ultima Thule. Patches of a bright yellow in cultivated soil suggested *Chrysanthemum segetum* but a subtle difference in colour made one doubt. After landing a visit was made to investigate the vegetation more closely when it was found that the colouring was due to another Composite, *Senecio aquaticus*, which, as its name suggests, grows with us in wet and in undisturbed grass of meadows and marshes. Here it chose ground of which the original covering had been removed or in which the soil itself had been disturbed by man. This showy plant, much more ornate than its Southern prototype, was common on the derelict fields around a crofter's cottage, on parts of moorland which had been prepared for corn, on waste places by road-sides, in poor garden ground or the bare stony shores of inland lochs. The plants were usually short, about 8 cm., and had a conspicuous, flat-topped, corymbose inflorescence of larger flower-heads with showy ray-florets of a slightly deeper tone of yellow. As Beeby remarked, "it grows as an inverted pyramid with flat-topped inflorescence." Occasionally the plants are clothed with a hoary or arachnoid tomentum. The lower leaves are usually but little cut, indeed often sub-entire, and are usually green beneath. The capitula are up to 43 mm. across. We saw it not only by Clickhimmin Loch and in waste ground about Lerwick, the Mainland, Tingwall, Whiteness Voe, near Walls and Sandwick, but also in Unst at Burrafirth and Balta Sound. The plant had an unmistakable facies of its own and it seems well worth segregation although some may question its claim to varietal grade. G. C. DRUCE.

1394. S. JACOBAEA L. In Nova Scotia this causes the Pictou cattle disease due, it is said, to a poisonous alkaloid or alkaloids. Other species in South Africa have toxic effects. See *Nature* 321, 1920.

1405. S. PALUSTRIS Hook. It was seen at Filby in 1902 by the Rev. G. H. HARRIS.

1422 (2). CIRSIUM POLYANTHEMUM DC. (C. SICULUM DC., nec Spreng.). Alien, Corsica, Italy, Europe austr.-orient., Asia austr.-occ. Var. CRETICUM (Lam.) Fiori et Paoletti. Marston brickyards, August 1920, with a forma *albiflorum*. G. C. DRUCE. Det. A. THELLUNG.

1449. CENTAUREA JACEA L., sub-sp. ANGUSTIFOLIA Gugler, var. SEMIFIMBRIATA Gugler. Wellington College, Berks, 1919, C. E. BRITTON.

1449. C. JACEA L., sub-sp. ANGUSTIFOLIA Gugler × C. NEMORALIS Jord. *C. Moncktonii* Britton, ined. Wellington College, Berks, 1920, H. W. MONCKTON.

1449. C. JACEA L., sub-sp. JUNGENS Gugler, var. FIMBRIATISQUAMA Gugler in Ann. Mus. Nat. Hung. 47, (1907) 1908. Waste heap north of Welwyn Tunnel, Herts, 1913, J. E. LITTLE. Mr C. E. Britton says he accepts this determination. *C. jungens* is intermediate between sub-sp. *Eu-Jacea* and *C. angustifolia*. It is of tall stature, branches of moderate length, upper leaves broadly lanceolate, peduncles with rather few leaves and always clearly inflated beneath the heads. The above variety has almost all the appendages regularly pectinate-fringed, the innermost series, however, always more or less entire, the next uppermost series less regularly laciniated. Similar plants, he says, have been met with elsewhere in England.

1451. C. NIGRA L. C. NEMOPHILA Jord. Wellington College, Berks, 1919, Ref. No. 2153, C. E. BRITTON.

1451. C. OBSCURA Jord., var. SUBNEMORALIS Britton, ined. Twinstead, N. Essex; Thurso, Caithness, G. C. DRUCE.

1456. C. SCABIOSA L., var. SPINULOSA Koch. Fallow field, Effingham, Surrey, September 1920, Ref. No. 2279, C. E. BRITTON. The description of this in Koch's *Synopsis* 412, 1837, is "fimbria terminali foliolorum involucri in spinam longiusculam validiorem mutata. Per totam Germaniam sparsim occurrit." He says other species of *Centaurea* exhibit the same variation.

1472. C. MACROCEPHALA Bunschk., ex Willd. Sp. Pl. iii., 2299. Alien. Armenia, etc. Hortal. On railway cutting, near Neithrop, Oxon, July 1920, with other garden relics, G. C. DRUCE.

Gen. 356 (2). LAGOSERIS M. Bieb. Cent. Pl. Rar. Ross. merid. i., t. 30, 1810, vice *Pterotheca* Cass. in Bull. Soc. Phil. 200, 1816. See *Rep. B.E.C.* 419, 1916, and Thellung *Fl. Adv. Montp.* 573.

1504 (10). L. NEMAUSENSIS (Gouan) Koch, vice *P. sancta* C. Koch. Alien. S. Europe. Charleston, Cornwall, 1920, V. TRESSIDDER.

1512. HIERACIUM AURANTIACUM L. A. A. Hansen writes a paper on The Hawkweeds or Paintbrushes, Circular No. 130, 1920, to the United States Dept. of Agriculture in which he alludes to the Orange Hawkweed of European origin which has now become one of the worst pasture and hay-field weeds of New England, New York, and Pennsylvania, spreading as it does both by its runners and seeds. *H. florentinum*, the King-Devil, and *H. pratense* have also spread rapidly. A Virginian pasture is shown in which the latter is as common as Buttercups. In Buckinghamshire allied species were introduced some twenty years ago and rapidly spread along the railway embankment near Hanslope, but as yet have made no headway into the adjoining fields, our sun being scarcely powerful enough to stimulate them.

1537 (2). H. PULMONARIOIDES Vill. Old wall, Kenmore, M. Perth, H. W. PUGSLEY in *Journal of Botany* 281, 1920.

1578. H. HOLOPHYLLUM W. R. L., var. ANGUSTISQUAMUM Pugsley. *l.c.* 284, 1920. Cheddar, H. W. PUGSLEY.

1641 (2). HYPOCHOERIS AETNENSIS B. & H. Gen. Pl. ii., 520.

Ces. Passer. & Gib. Comp. Fl. Ital. 465. *Serriola aetnensis* L. Alien. Europe mer., Africa bor. Leith Docks, September 1920, JAMES FRASER.

1643. LEONTODON AUTUMNALIS L., var. CORONOPIFOLIUS Lange. Ostenfeld (*Bot. Notiser* 143, 1913) refers to the occurrence of this in Denmark, and as this may occur in Britain the description there given is appended. "Scapi plures, ± arcuati, 15-25 cm. alti, ramosi, ramis longis, squamis haud paucis, angustis, usque ad 5 mm. longis. *Folia supra sparse pilosa subtus glabra*, 8-10 cm. longa, petiolis valde alatis, *nervo principali lato, ± purpureo colorato, pinnatifida, lobis distantibus, filiformibus vel linearibus, longis, lobo apicali lobis caeteris consimili*, perlongo, lineari. Involucrum mediocre vel parvum, viride, *non pilosum, floccis albis parce adspersum*; squamae elongatae, anguste oblongo-linearis, subacutae, stria dorsali indistincta, subnigra, marginibus floccosis-ciliatis. Calatium mediocre. Stylo in sicco nigrescens."

1645. TARAXACUM CROCEUM Dahlst. Om Skand. Tarax. former Bot. Notiser 1905 et Nords. Tarax. 15. 1912. Folia sat laete gramineo-viridia, tenuia ± lingulata anguste lanceolata, pauci (3-6) loba, glabra-subglabra v. in nervo mediano parce araneosa, petiolis pallidis sat angustis-latiusculis ± alatis, nervo mediano pallido v. medio praesertim ± roseola, extima (interdum plurima) saepe subintegra parce denticulata, dentibus apicem versus magis evolutis, exteriora et intermedia lobis latis-latissimis ± humilibus sursum saepe in interlobia brevia-sat longa angustata, margine superiore ± convexo-recto, in lob. inferioribus parce dentato, in superioribus integro, rarius in omnibus sparsim subulato-dentatis, apicibus retroversis-patentibus, saepe apice ipso hamatis, lobo terminali sagittato-hastato, lobulis lateralibus, retroversis-patentibus, brevi-sat longo, latiusculo-lato, acuto v. saepe elongato, acutissimo, interiora lobo terminali saepe in utroque latere dente singulo, curvato, angusto instructa et lobulis lateralibus saepe hamatis, intima latiora, lobis crebrioribus, magis dentatis, lobo terminali majore, inferne magis dentato, marginibus magis convexis, minus acuto. Scapi folia aequantes v. iis longiores, colorati, glabri-subglabri, superne leviter araneosi. Involucrum mediocre-sat magnum, crassiusculum, plerumque sat obscure viride, basi ± ovata. Squamae exteriores ± ovato-lancelatae, acuminatae, patentes-erecto-patentes v. laxe adpressae, paullum-sat conspicue marginatae, supra sat dilute virides, subtus obscure virides-fere atrovirides, apice saepe et interdum etiam secus margines ± purpurascentes; interiores sat obscure virides ± lineari-lanceolatae, in apicem ± purpureum, angustum attenuatae. Calathium 35-50 mm. latum, sat plenum v. leviter radians ± croceum. Ligulae marginales latiusculae, extus stria rubro-violacea notatae. Antherae polline carentes v. rarius polliniferae. Stylus ± luteus, stigmatibus ± virescentibus. Achenium fusco-olivaceum v. olivaceo-umbrinum superne et saepe fere ad basin ± crebre et acute spinulosum, caeterum late spinuloso-tuberculatum v. tuberculatum, 3. 5-4. 5 mm. longum 1 mm. latum v. paullo latius, pyramide 0.5-0.7 longo ± conico, rostro 7 9 mm. longo. On the north side of the Cairngorm range as in Corrie Lochain and Corrie Sneachda on damp rocky or grassy places, 3000-3500ft. alt. First found in August 1919. G. C. DRUCE. It occurs in Scandinavia, Iceland, Greenland, and in the Faroes, where it grew outside enclosed fields, on hedges, and in rock-clefts some way up the hills. It belongs to the Spectabilia.

1645 (2). T. NAEVOSUM Dahlstedt in Warming's Bot. of Faroes 840. Folia dense et late lobata-pinnatifido-lobata, lobis latis-angustis deltoideis, utrinque vel praecipue in margine superiora ± dentata inferne angustius lobata, inter lobos inferne ± irregulariter dentata lobi terminali satis brevi, lato ovato-triangulari-hastato, supra purpureo-vel atropurpureo-maculata (vel in umbrosis fere emaculata) et in pagina superiore vulgo pilis crassis articulatis sparsis-densiusculis obtecta, petiolis ± intense purpureis nervoque mediano inferne v. pro max. parte purpureo. Involucrum ± obscure oleraceum, magnum satis longum, squamis exterioribus longis lanceolatis breve acuminatis, supra medium inv. attingentibus, anguste v. inconspicue marginatis, apice ± purpureis v. fusco-purpureis et in pag. interiore superne ± fuscoviolaceis, laxe adpressis v. erecto-patentibus, apicibus vulgo ± recurvato-patentibus, interioribus sub apice ± purpureo leviter callosis. Calathium obscure luteum, multiflorum, radians. Ligulae longae, marginales latiusculae, extus stria lata rubro-purpurea vittatae dentibus in lig. ± rubris. An-

therae polline ± repletae. Stylus et stigma livescentes. Achenium fusco-stramineum apice muricato-spinulosum, caeterum fere laeve v. minute tuberculatum, c. 4 mm. long., 1 mm. latum, pyramide c. 0.9 mm. longo, rostro 8-9 mm. longo et pappo albo. *T. naevosum* differs from *T. spectabile*, var. *maculiferum*, by longer, more patent outer phyllaries, shorter achenes, shorter beak but longer and more developed rostrum. This handsome plant, which evidently belonged to the Spectabilia, was abundant in a cornfield near Marcham, Berks, in September 1920. Dahlstedt identifies it as his *naevosum*, first found in a ravine near Kvanhauge in the Faroes by Hartz and Ostenfeld in 1897, and it is rather common in the alpine and sub-alpine parts of the Scandinavian mountains. Herr Dahlstedt writes (1921) that he believes it is an ancient pre-glacial form, that before the last Ice-age had its distribution in N.W. Europe, and during the same period inhabited the N.W. coasts of Norway probably at that time free from ice. At present it inhabits the central and northern parts of the Scandinavian peninsula, and is also found in the Faroes and Iceland. The English form differs slightly from most Swedish specimens by its broader and more recurved lobes and by the slightly darker colour of the flower. Specimens are distributed this year.

1645. T. FULVUM Raunkier Dansk. Excurs. Flora 1906. This species of the Erythrosperma is very common (says Dahlstedt *in litt.*) in the southern and partly also in the central parts of the Scandinavian peninsula, occurring also in Finland and Denmark. In central Scandinavia its distribution seems chiefly due to cultivation. In Britain I have found it at Oxford [× 20], and in Berkshire, as a medium-sized plant with rather strongly cut leaves.

1645. T. BRACHYGLOSSUM Dahlst. (see *Rep.* 566, 1920) from Wyrardisbury, Bucks; Barnes Common, Surrey, also occurs at Oxford [× 29], and Boar's Hill, Berks. This, Dahlstedt says, is distributed in southern Norway and Sweden, also in Denmark, Northern Germany, in a few localities in Austria, and adventive in the Eastern United States. The leaves are less divided than in ordinary forms of *laevigatum*.

Of the Vulgaria group Herr Dahlstedt has named the following from my gatherings :—

1645. T. EXPALLIDUM Dahlst. Ostsvenska Taraxaca Arch. fur Botanik, Band 9. n. 10. The English form is not quite identical with the Swedish one, but the slight differences are probably only due to the locality. Oxford [× 16]. A strong growing plant with deeply cut leaves, the upper portion triangular.

1645. T. KJELLMANI Dahlst. Einige wildwachsende Taraxaca aus em Bot. Gart. Upsala . . . 1906. Scandinavia, Finland, Denmark. A slight modification of this occurred in considerable quantity in arable fields near Stow Wood, Oxford [× 14].

1645. T. SUBLACINIOSUM Dahlst. inedit. This grew also in arable ground near Beckley, Oxford [× 15] : it has hitherto only been noticed in two localities in Finland and Sweden, and will shortly be described by Herr Dahlstedt. The leaf-cutting does not reach to the mid-rib, the leaves are large, and the plant robust.

1645. T. ANGUSTISQUAMEUM Dahlst. in Tarax. formerer . . . Finland Acta Soc. pro. fauna et flora Fennica no. 9. 1907. Very common in southern Sweden, Norway, and Finland, also found in eastern Germany. As a slight modification this grew by the roadside at Beckley, Oxon.

1645. T. INTRICATUM Lindb. f. in Finska Tarax. former Meddel. af Soc. pro. fauna et flora Fennica h. 36, 1910. A closely related form, if not a new species, occurs at Oxford [× 28], as a very distinct looking plant, the leaf-cutting being very irregular.

1645. T. CROCEIFLORUM Dahlst. This grew in light, sandy soil of an arable field at Longworth, Berks, in 1920.

1645. T. DILATATUM Lindb. f. As a form this occurs at Oxford [× 10]. It is a tall, coarse-growing plant with a large terminal lobe and shallow leaf-cutting.

1645. T. ALATUM Lindb. f., *l.c.* no. 9. 1907. A plant closely related to this grows in garden ground at Oxford [× 11].

1645. T. FASCIATUM Dahlst. Tarax. Scand. exsicc. fasc. 1. n. 30, 1911. An allied plant occurs at Longworth, Berks, in arable land [× 21]. The two last require further study, and may prove distinct. G. C. DRUCE.

1645. T. LAETICOLOR Dahlstedt Scand. Exsicc. fasc.1, No. 21. 1911. Not typical as the leaves are different : teste DAHLSTEDT.

[Ref. No. R. 7116.] Chertsey, Surrey, May 1917, G. C. Druce and Lady Davy. See *Rep. B.E.C.*, 1918.

1665 (4). Lobelia natalensis A. DC. in DC. Prod. vii., 369. Alien, South Africa. Hortal. Marston brick-yards, Oxon, September 1920, G. C. Druce. Det. W. B. Turrill, who says the flowers are rather large.

1667 (2). Cervicina pendula (Schrad.). *Wahlenbergia pendula* (Schrad.) Blumenb. in Obs. 38. *W. lobelioides* Link. Alien, Madeira, Canaries. Hortal. A weed in Bevers Nursery grounds, Herts. J. Ansell, about 1835.

1687. Oxycoccus quadripetalus Gilib. Above Harlech, Merioneth, 1919, Miss M. Cobbe. Infected with an *Oidium* which Mr Swanston thinks may be *Podosphaera myrtillina*. It gives a curious hoary appearance to the under surfaces of the leaves.

1742. Anagallis femina Mill. Miss Claridge found at Steeple Aston, Oxon, a form with three leaves in a whorl—an analagous form to the var. *verticillata* A. Diard of *A. arvensis*, and another proof of the close relationship of the two species. If worth distinguishing, it may be called forma *ternata*. G. C. Druce.

1743. A. arvensis L. I have come to the conclusion that the opening and closing of the corolla is governed much more by the habit of the plant, consistently maintained to a great extent irrespective of the weather conditions, than by cloudy or bright weather. As an instance of what I noticed on one particular day at eleven o'clock on a very cloudy drizzly morning after a previous day and night of rain, out of 280 blooms 185 were fully open and 95 partially, these latter being newly opened flowers in the first stage with unopened anthers and unpollinated stigmas. After careful watching many plants for two or three weeks I found many flowers were visited by a species of mite which, under a strong lens, appeared to feed on the hairs of the stamens and on any pollen grains on the petals, but in no case did they appear to travel up to the anthers or stigmas. Müller observed no insect visitors, and Lord Avebury mentioned

Halictus morio, a solitary bee, as the only insect yet recorded as a visitor. J. E. ARNETT.

1743. A. ARVENSIS L., with dark purple-coloured flowers. Charlestown, Cornwall, 1920, W. TRESIDDER.

1808 (2). PULMONARIA AFFINIS Jord. With reference to the grade of citizenship of the Lungwort which was discovered in Dartington Wood, S. Devon, in 1919, by C. V. MARQUAND, he informs me "it grew in a wild wood some distance from any house, but as the copse is on a private estate where a number of plants have undoubtedly been introduced it is possible that it was brought there some time ago." See *Rep. B.E.C.* 570, 1919.

1846. SOLANUM NIGRUM L., var. nov. SINUATUM. In *English Botany* iv., 97, Syme describes the leaves of *nigrum* as "dentate or repand, lamina 1-4 inches long, rather abruptly narrowed into the base and continued downwards into the winged petiole, the outline varying from ovate to rhomboidal, but generally intermediate between these, margins entire, repand, or with a few large deltoid teeth." On rubbish heaps, wool-refuse and tilts, in various parts of Britain, there is a distinct plant with the leaf-outline of *miniatum* but with black berries which deserves at least varietal distinction. It is a smaller and cleaner looking plant with leaves having smaller laminae, ¾-1½ inches long and ½ to 1¼ inches broad, the margins sinuate-dentate; calyx-lobes longer than type. Specimens were sent to the Club by J. CRYER in 1917 from Bradford. Waste ground, Abingdon, Berks, G. C. DRUCE, 1915; Thetford, Norfolk, 1920, Miss COBBE. The Rev. E. S. MARSHALL says in 1917 he had a plant from Witley, Surrey, which comes near it. It is quite probable that it may be a micro-species, the geographical source of which is, at present, conjectural. G. C. DRUCE.

1872 (12). ALONSOA MERIDIONALIS (L. f.) O. Kuntze. *Scrophularia meridionalis* L. f., 1781. *A. caulialata* R. & P., 1798. Alien, Andes (equator), Mexico. Near a mill at Bovey Tracey Station, Devon, September 1919, Lady DAVY.

1874 (3). LINARIA RETICULATA Desv. Fl. Atl. ii., 48. Alien.

Portugal, Algeria. Hortal. Aberystwith, Cardigan, 1920, D. A. JONES.

1899. MIMULUS MOSCHATUS Dougl. A suggestion was made at a meeting of the Birmingham Field Naturalists' Club that the loss of fragrance may be due to the atrophy of the scent-producing cells owing to a change in the insect visitors by which fertilisation is effected.

1901 (2). LIMOSELLA CAPENSIS Thunb. Prod. Fl. Cap. 104. Alien, South Africa. Bradford, York, September 1920, J. CRYER. Det. at Kew.

1906 (5). VERONICA TEUCRIUM L. Alien, Europe. On the railway-bank near Neithrop, Oxford, July 1920. Hortal. Grown with other garden plants. Probably the railway cutting was made through a garden. G. C. DRUCE.

1906 (6). V. PROSTRATA L. Alien, Europe. Hortal. Cardigan, G. C. DRUCE.

1908. V. CHAMAEDRYS L., sub-var. ALBA, comb. nov. Miss EDITH WILLIAMS records the Germander Speedwell with snow-white flowers as growing between Beaulieu River and Southampton Water, S. Hants.

1920. V. ACINIFOLIA L. See *Rep. B.E.C.* 730, 1919. This was discovered in a field near Chiddingfield, Surrey, in 1920, by Mrs WILD and Mr E. B. BISHOP. Under their guidance, in company with Lady Davy, I was enabled to see it growing last May. The Veronica grew in a barley field on a somewhat stiff (not sandy) soil, in enormous quantities, giving in the places where the barley was thin a bluish tone of colour from the multitude of flowers. It occurred in small quantity in the adjoining field. Its frequency was a proof that it was of not quite recent introduction, nor could one ascertain with what crop it was brought. In another area of Surrey a large quantity of South European species owe their occurrence to the ground having been manured with shoddy waste, but this grew in a country of less intensive culture and outside the market gardening area. Its occurrence here in such quantity places it in a different category from the accidental alien. It was observed among other adventive plants at Slateford, near Edinburgh, by Mr J. Fraser about 1907, on the evidence of which it was included in the *British Plant List*. In 1909 it occurred as a weed in a nursery garden near Ashdown Forest, Sussex. *V. acinifolia* L. has a wide range through Southern Europe and is found in France, rarely in Belgium, and in Alsace and Baden. It also occurs in Madeira and in Asia austro-occ. Rouy says it grows " champs humides, sablonneux ou argileux dans presque toute la France." It is adventive at Conçepion in Chile (see *Beechey Voy.* 39). Rouy (*Fl. Fr.* xi., 50) places it next to *arvensis* from which the almost entire and rather fleshy leaves at once distinguish it: indeed it is not likely to be confounded with any British species. The pedicels equal the oblong bracts and are 3-4 times longer than the calyx, and the style is longer than the deep notch of the obcordate capsule.

1929 (3). V. ORIENTALIS Mill. Gard. Dict. 1768. Alien, Russia, Roumania. Hortal. Levenhall, Edinburgh, July 1917, J. FRASER.

2083. AJUGA REPTANS L., var. vel sub-var. ALBIFLORA Zersi in Prosp. Piante Vasc. pr. Brexia 169, 1871. This proves constant in culture. See *Fl. Ital. Exsicc.* 2321. Appleton, etc. (see *Fl. Berks* 413); near the Beaulieu River, S. Hants, Miss E. WILLIAMS.

2088 (2). PLANTAGO CYNOPS L. In 1902 and subsequent years this occurred in a field abandoned from cultivation, on chalk soil, on the higher slopes of a hill between Cobham and Luddesdown, West Kent. One old shrubby plant and several others of various ages were seen. The plants accompanying the *Plantago* were the usual species seen in abandoned arable fields on the chalk, *Silene latifolia*, *Fumaria*, *Papaver*, *Echium vulgare*, *Carduus nutans*, *Reseda Lutea*, *Ajuga Chamoepitys*, &c. Here, also, I saw for the first time, *Adonis*. On taking a specimen of the *Plantago* to the Herbarium of the Natural History Museum, I am sorry to say that my plant did not receive the attention it deserved, and no attempt was made to identify it beyond showing it to an official, now retired, who characterised it as a miserable scrap and said that a better specimen was required for purpose of determination! To my inexperienced eyes the specimen obviously represented a shrubby plantain, and had attention been given to it its identity could easily have been established, as no other species similar to *P. Cynops* reaches into Western Europe. When, in 1906, I acquired the concluding volume of L'Abbe Coste's illustrated Flora, the identification of the *Plantago* was placed beyond doubt and confirmed by reference to other continental floras. The plant was restricted to land formerly cultivated and certainly did not occur on neighbouring banks, as these were well searched at that time for orchids. In 1905 the field was ploughed and the *Plantago* disappeared from the locality, nor was it seen elsewhere. C. E. BRITTON. *P. Cynops* occurs in Spain, South France, Italy, South Switzerland, Austria. A caulescent fruticose species, growing in uncultivated places was sent me in June by Miss Ridley. It was gathered by a young child whom she had interested in flower-study, on a rough bank above cornfields and below a small wood near Cobham, Kent. The patch stretches for about 4 or 5 yards and there are a few isolated plants near. Mr Green and Mrs Stephens also sent it me from the same place later on in the season. A note on it from Mr H. N. Ridley appeared afterwards in the *Journal of Botany*. In November Mrs Wedgwood accompanied me to see it growing. The place is a flinty and chalky bank, and its associates are *Origanum* and other native species. There was nothing to suggest its origin. Its geographical range is antagonistic to its being native in Kent, but its method of introduction is not easy to suggest. It has no beauty that man should desire it: it is not a native of cornfields, so that it is not likely to have come in with game or chicken-food. Mr Britton's note shows that it is not a quite recent immigrant. There is an old record of *P. Psyllium* from Sand Hills, St Aubin's, Jersey (see Hook. *Stud. Fl.* Appendix). Naylor (*Trans. Bot. Soc. Edin.* 466, 1860) corrected the name to *P. Cynops*. In both Jersey, where it is not now to be found, and Kent it is almost certainly adventive. G. C. DRUCE.

2091. P. MARITIMA L. The power of Linnaeus in grouping and individualising species is well exemplified in the five British Plantains which he includes in the *Species Plantarum*. They are so distinct as to offer no difficulty to the botanist in their identification.

They can be distinguished at a glance, yet each of them offers a wide range of variation, and to many of these variations distinguishing names have been given. One of the most polymorphic of the Linnean species is *P. maritima*, which is briefly diagnosed by Linnaeus (*Sp. Pl.* 114, 1753): Foliis semicylindraceis integerrimis basi lanatis, scapo tereti. Omitting reference to variations mentioned by British botanists of the 17th and 18th centuries, Edmondston (*Flora of Shetland* 17, 1845) was one of the first to draw attention to the matter. In that work he gives "*P. maritima*, sea shores, common; it has leaves erect, narrow lanceolate, smooth, spike cylindrical," which well represents the Linnean plant. He adds a variety *dentata*, tersely described "leaves toothed," previously established as a form by Persoon (*Syn. Pl.* i., 139, 1805), who, although he does not actually use the word *forma*, does, as Williams points out (*Prod.* 360), distinguish varieties from forms by an ingenious device in the use of Greek letters. When the diagnoses of a species run on to letter B in a continuous line it indicates merely a form. Wirtgen precedes Edmondston as the author of the variety. Edmondston then says he "provisionally gives the name *P. setacea* to a plant not uncommon in mountainous districts which has hitherto been confounded with *maritima*, with leaves lying flat on the ground, cylindrical or semicylindrical, spikes globular," with a "var. *lanosa*, base of the leaves woolly." Therefore it is not a nomen nudum, as is stated in the *Prodromus*. It will be observed that no mention is made of the leaf-clothing, so that we may assume it is glabrous or semi-glabrous as in *maritima*. Subsequently, Sir W. Hooker (*Brit. Flora* 67, 1842) gives two varieties:—"*major*, leaves almost plane inclining to lanceolate, toothed, glabrous, scape densely hairy, on rocks, Isle of Cumbra," probably var. *dentata*, and "var. *minor*, leaves linear-lanceolate, densely hairy, (clothed with short dense hairs) as well as scape, rocks by the House of Skail, Orkney." Both these varieties Williams (*l.c.*) says, "differ only in size and do not require notice. The latter includes plants growing on poor and exposed soils." But he does notice them under his var. *alpina*=*P. alpina* L., which is more than doubtfully British. Under this is a forma *hirsuta* (identified as *P. hirsuta* of Gilibert), which is localised from Hooker's habitat for his *minor*, with which we may presume it is identical. But Williams complicates the matter by putting under the same name Edmondston's *lanosa*, which is a different plant, as will be seen by the descriptions already cited. Syme (*Eng. Bot.* vii., 172) has three varieties, one of which, var. *linearis*, having "leaves linear-strapshaped, 3-ribbed, rarely with only 1 prominent nerve; plant glabrous, generally with hairs at the crown of the rootstock and sometimes pubescent on the scapes," covers Edmondston's *setacea* and its variety. His var. *latifolia*, the type of which came from Gravesend and Whitstable, has "leaves strapshaped-oblanceolate, 3-7 ribbed. Plant glabrous, or with a few hairs at the crown of the rootstock" as in the previous variety. His third variety, *hirsuta*, has "leaves linear-strapshaped or semi-cylindrical, 3- or 1-nerved. Plant densely pubescent." This, he says, he has seen only from the Orkneys at Houton Head. He mentions that Walker Arnott (*sic* Hooker) records it from near the House of Skail but does not cite the var. *minor* as a synonym. As a matter of fact, Syme's variety is a linear-strapshaped leaved plant, whereas Hooker's was linear-lanceolate. Syme adds that he cannot differentiate the mountain from the coast plant as the leaves are as much channelled and the rootstock not more woody than in the coast plant. Williams (*Prod.* 360) greatly elaborates the treatment of variations. He gives five varieties and six forms. The first, *communis*, is the type. (2) *Scorzonerifolia*=*lanceolata* Syme has precedence according to the Actes. (3) *Serpentina* Brand=*P. serpentina* Vill., with two forms, *ciliata* from Ben Laoigh, which is very doubtfully the plant of Villars, and *bidentata*, a toothed form from the Snowdon range. (4) *Alpina*=*P. alpina* L., which differs, he says, in having the nerves of the leaves unequally distant, *i.e.*, with the lateral nerves nearer the margin than the midrib, also in the rhizome being long and woody instead of short and fleshy. It has three forms—(1) *pilescens*, from Widdy Bank, glabrous or slightly pubescent, 14-16 cm. high; (2) *pumila* Kjellm., a pubescent, dwarf form from N. Scotland, 5 cm. high; and (3) *hirsuta*, a densely hairy plant, 8 cm., found in the Orkneys and Shetlands, which he says must be the *P. hirsuta* Gilibert Fl. Lith. i., 17, 1781, an identification I have been unable to confirm. There is also a var. *recurvata*, based on Cornish plants, said to agree with authentic specimens from France. It was described as a species in the Linnean *Mantissa*. My own *List* contains the vars. *minor* Hook., *pygmaea* Kjellm., which should be *pumila* (Kjellm.), *hirsuta* Syme, *latifolia* Syme, and *dentata* Wirtg. Allusion has already been made to the polymorphy of *P. maritima*, which it shares with the other British representatives of the genus. In this instance it is increased by the fact that the plant, though essentially littoral, also grows in inland localities. The halophytic forms again have two grades—those of muddy places and those of arenaceous or rupestral habitats. Normally the broad-leaved halophytes are found on the rich mud of tidal rivers and estuaries, *e.g.*, the banks of the Beauly River, Inverness; near Newquay, Cornwall; the Crouch estuary, the foreshore of the tidal Thames, &c. In these plants the leaves are over half an inch wide. The almost glabrous leaves are occasionally toothed (*dentata*). As the mud becomes denser usually the leaves become narrower. On rocky and sandy ground in full exposure the plants become dwarfed, the leaves narrower, and then they often have the tuft of hairs more or less developed at the top of the rootstock. Normally the leaves themselves have only scattered hairs. Therefore we have on the softest mud the vars. *latifolia* and *dentata*, on the stiffer muddy foreshore the type, and on rocky ground the var. *leptophylla*, characterised by its long and narrow leaves, and on the exposed surface of rocky and sandy headlands such plants as *lanosa* Edmondston, the *recurvata* of Williams, the *pumila* of Kjellmann, and plants which have been wrongly assigned to the var. *minor* of Hooker. In inland, and especially mountainous places, we have narrow, long-leaved plants which have been, with some doubt, referred to *serpentina* Vill., and others with a very woody and prominent rootstock and, it is said, with the veins of the leaves unequally distant, which I think have been wrongly referred to the Linnean *alpina*. In the *Report* 171, 1912, therefore, I named the montane plant *P. Hudsoniana*, because Hudson had wrongly based his *P. montana* on a plant gathered by Lloyd on Trigvulcaugh, Carnarvon, but he also (under his *montana*) included a mountain form of *P. lanceolata*, *i.e.*, var. *sphaerostachya*. The true *maritima* form from that place is referred to by Dr Richardson (*Corresp.* 239), who says:—" At the top of the Glyder are Trigvulcaugh rocks, on the north side of which, growing out of the cliffs of the steep rocks, you'll find the *Plantago minor angustifolia*, J.B.: This seems to me a distinct plant from the marine one: the leaves are shorter, narrower, more rigid; the spikes are shorter. I have kept it in my garden ever since I was in Wales with Mr Llwyd [This makes it clear he is referring to Llwyd's plant] and it never varies. That from Durham and Northumberland is no other than the marine one. I have this also in my garden." In a subsequent letter, dated October 25, 1726, he alludes again to it, but queries if it is Bauhin's plant. He repeats the observations about it which he made to Sherard, and adds that it remains constant in his garden. Buddle wrongly thought that the *lanceolata* plant was the one found by Ray, and this misled Hudson as he afterwards discovered, so that in the second edition of the *Flora Anglica* he puts the plant of Llwyd and Ray under *maritima* as a var. without a Latin trivial, merely calling it the Mountain Plantain. He united under the same species the erroneously named *P. Loeflingii* of the first edition, owing to the figure of Petiver being erroneously cited (for *Loeflingii*) by Linnaeus, the English plant being a slightly toothed form of *maritima*. Babington (*Manual* 272, 1856) says "it is apparently *P. serpentina* Vill. . . . a distinct species," but in 1874 (*Manual* 289) he says "it may be *serpentina* or *alpina*." For these reasons, and because I thought that this mountain-cliff plant was a distinct race or a sub-species, I named it *P. Hudsoniana*. I have found it on the Glydyr, in Llwyd's locality; on Scuir Alastair, Skye; on the Cnochan rock, Ross and Sutherland; on Ben Laoigh, Perth and Argyll. This plant only collaterally comes into our survey of *maritima*. Another plant has now to be considered, the *minor* of Hooker, and for the greater part the *hirsuta* of Syme and Williams. This differs from all the plants mentioned, having the whole of the foliage covered with short dense hairs and, what has escaped the notice of some writers, wider and shorter leaves. This seems restricted to the Orkneys (Hoy and Pomona), to Unst and the Mainland of Shetland, and was one of the objects of my northern visit this summer. I saw it in both groups of islands. Hooker's type was an Orkney plant. Similar ones occurred in Shetland, but on the serpentine at Balta there occurred with it a closely-related plant. This was much larger and had a very conspicuous rootstock, which was covered for some portion of its length with dry leaves of many preceding years. This gave it the appearance of a branch of *Araucaria*, since the crowded leaves were lanceolate, narrowed to a short point, and covered with a silvery pubescence. It had all the appearance of a very distinct species. The variation is, apparently, not due to soil or exposure, since narrow, hairy-leaved plants grew near as well as narrow-leaved glabrous plants except for the white hairs about the rootstock. Two suggestions occurred to one as this wind-swept barren tract of serpentine was traversed. Was this a distinct species crossed with other forms of *P. maritima*, thus giving rise to the great number of intermediate plants, or could it be that *P. lanceolata* entered into its composition and transmitted its pubescence and its broader leaves to the offspring, which have a more pronounced root-stock, fleshier leaves and other strong evidences of *maritima*? In either case the extraordinary variability of the Plantains here might be accounted for. Provisionally, I distinguish this curious plantain by the name of *P. Edmondstonii* in honour of the boy-botanist who discovered *Arenaria norvegica* on the very place where this plantain grows. Further research may prove it to be a hybrid. The plants had no ripe seeds. Several species, however, rarely seed in these northern latitudes. Into this might be merged the broad-leaved forms of var. *hirsuta* Syme and var. *minor* Hooker. Each of the trivials is rejected on account of the confusion arising from their use, and it is by no means ascertained that the Shetland plant is identical with Gilibert's *hirsuta*. The Orkney plant is less pronounced than the Baltasound specimens, and some may prefer to use the name *minor* for these small plants under *Edmondstonii*. The specimens in our public herbaria give no idea of the latter plant.

PLANTAGO EDMONDSTONII mihi. Root very long, branching as it nears the soil-surface into many (up to 20) subsidiary stems, each bearing 1-3 scapes. Rootstock above the ground, stout, woody, up to 2½ inches high, bearing crowded, unequally 3-4 nerved leaves, the lamina up to 1½ inches long, lanceolate, rather fleshy, thickly covered with shaggy, white, loosely appressed hairs, especially on the under surface, with a quantity of white tomentum at the leaf-base and on the short petiole. Scape up to 5 inches high, strongly but shortly hairy. Spike ⅜-1 inch long by ¼ inch broad. In several places on the serpentine at Baltasound as at Springfield, Keen of Hamar, &c., Orkney: Helia, Hoy (Johnston), and near Black Craig, but not typical. G. C. DRUCE.

2091. P. MARITIMA L., var. LANOSA (Edmondston Fl. Shetl. as a var. of *setacea*). Balta, Burrafirth, Unst, near Black Craig, Orkney; Scrabster, Holburn Head, Caithness; Betty Hill, Sutherland; Tain, Ross; Giant's Causeway, Antrim. The name precedes *linearis* Syme. G. C. DRUCE.

2091. P. MARITIMA L., var. PUNCTATA L. M. Neuman in Bot. Not. 251, 1905. At Yarmouth, Isle of Wight, this spring, a large number of plants of *maritima* were variegated with blackish-red spots which appeared likely to have been caused by some insect. They are referable to the above variety if the character mentioned is sufficient to merit that grade. Lusus or forma seems to be the more correct definition. The plants had a strange appearance, so regular and striking was the spotting. G. C. DRUCE.

2100 (3). P. ARISTATA Michx. Fl. Bor. Amer. i., 94. Alien, America bor. North Queensferry, Fife, 1919, A. TEMPLEMAN, teste W. B. TURRILL.

Gen. 501 (2). TELEPHIUM L.

2102 (2). T. IMPERATI L. Alien, Europe. Wensleydale, Yorks, 1846, *Hb. Ansell*; coll. T. SIMPSON. There appears to be no other record of this adventive species. It seems to be unwise to assume that this ever grew wild in Yorkshire. Simpson sent several plants to Ansell of dubious indigenity.

2123. × CHENOPODIUM PREISMANNI Murr = C. ALBUM × OPULIFOLIUM. See *Rep. B.E.C.* iii., 173, 1912, where *C. Wheldoni*, a hybrid with *striatum*, is recorded. Bradford, Yorks, 1919, J. CRYER. Named by Murr.

2124. C. ALBUM L., var. PSEUDOSTRIATUM Zschacke, f. SUBSTRIATUM (Murr) as a var. Galashiels, Selkirk, 1919, Miss I. M. HAYWARD.

2124. C. ALBUM L. (VIRIDESCENS St. Am.), var. VIVAX (Sonder). See Murr in *Mag. Bot. Cap.* 9, 1903. Alien. Falmouth, Cornwall, 1917, Miss M. COBBE.

2124 (2). C. PSEUDOPULIFOLIUM J. B. Scholz. This, teste Murr, is a good species, morphologically and geographically. See *Adv. Fl. Tweedside* 190. These specimens, gathered in 1919, corroborate the rather doubtful identification given in that Flora. G. C. DRUCE.

2124 (3). C. TREASURICUM J. B. Scholz, var. COMPLIMENTOSUM Murr, sub-var. PAUPERRIMUM Murr = C. BORBASII Murr (C. OPULIFOLIUM × ALBUM). Valde propinquum etiam *C. Preissianum*. Aldeburgh, Suffolk, 1920, Miss COBBE.

2131 (4). C. BERLANDIERII Moq., nova forma HASTATUM Murr, *in litt.* Billingshurst, W. Sussex, 1917, A. WEBSTER.

2144. ATRIPLEX PATULA L., var. GRACILIS. Plant slender, much branched from the base, forming a bushy growth; leaves thin, lanceolate, entire, or with an obscure tooth; inflorescence in narrow bracteate spikes; calyces slightly mealy, small, nearly entire. Sewage works, Leeds, 1919. [Ref. p. 78.] Sent by J. CRYER. G. C. DRUCE.

[2146. A. CALOTHECA Fr. *A. hastata* L., p.p. Plants so named by Mr Arthur Bennett were found by Mr George Lillie on the Caithness coast between Dunbeath village and the Castle, and also near Latheronwheel Harbour last September, only they are not the *calotheca* of Fries, but similar, I think, to plants gathered by me in the Orkneys, Sutherland, Forfar and Wigton which await a name].

Gen. 523 (2). THYMELAEA (Tourn.) Miller Abr. 1754.

2215 (5). T. PASSERINA (L). Lange in Willk. & Lange Prod. Fl. Hisp. i., 298. *T. arvensis* Lam. Fl. Fr. iii., 218. *Stellera Passerina* L. *Lygaea Passerina* Fas., ex Nyman. Alien. Found by Mr James Fraser at Levenhall, Midlothian, in 1916. It is a native of Central and Eastern Europe.

2229. EUPHORBIA ESULA L. See *Report* 574. 1919. This is allied to *salicifolia* and *virgata*. *Salicifolia* may be distinguished from either of the others by the lunate involucral glands being without horns. The leaves are broadest at or below the middle, with thick short hairs, especially on the under surface. In *Esula* the leaves are lanceolate, broadest above the middle, or nearly of the same breadth throughout, glabrous, thin and obtuse at the apex. The involucral gland has a horn on each cusp. In *virgata* the leaves are narrower, linear-lanceolate or lanceolate, broadest below the middle, glabrous and rather firm in texture. The involucral gland has a long spreading horn on each cusp.

2229. E. CYPARISSIAS L., forma LATEBRACTEATA Schroeter, teste Thellung. As *E. Pseudo-Cyperissias* from Walton Downs, Surrey. 1920, well-established, [Ref. No. 2285], C. E. BRITTON.

2243. MERCURIALIS ANNUA L. See C. Yampolsky in *American Nat.* 280, 1920, who finds that sex is not a fixed condition and that a plant may change its sex during the progress of its life cycle. *Bot. Abs.* n. 750, vol. 6, 105, 1920.

Gen. 561. EPIPACTIS. Synopsis of British Species. In view of recent work, a synopsis of the British forms of *Epipactis* may be found useful; but we do not care to attempt a "key," which would probably prove faulty at some point. Even the following synopsis should not be absolutely relied upon for purposes of identification, since any abbreviated summary is liable to be so worded as to exclude unusual individuals; but it will be serviceable as a starting-point, and longer descriptions can be used as confirmation. Dried material in this genus is not of much use.

A practically complete account of the British forms will be found in recent volumes of the *Journal of Botany*—1913, 343, Wheldon and Travis; 1918, 1, T. and T. A. Stephenson; 1919, 37, 80; 1920, 33, Col. Godfery; and 1920, 209; 1921, 33, T. and T. A. Stephenson.

1. The reproductive organs are arranged for self-fertilisation. The rostellum is rudimentary, and soon disappears. This is a very definite character, yet not easy to detect without careful scrutiny, and almost impossible when the plant is dried.

E. VIRIDFLORA Reich.

v. *dunensis* T. and T. A. Stephenson. Whole plant yellowish-green but for purple sometimes at the base of the stem, stems solitary or in pairs, flowers green or without much tinge of brown, sometimes a little lilac on the epichile, point of lip recurved. Coastal sand-dunes in the West.

v. *leptochila* Godfery. May be wholly green, flowers tinged green or somewhat brownish in tinge, usually with a whitish lip which is not recurved, leaves lanceolate. Sometimes flowers and leaves delicate, sometimes coarser and with the general appearance of *E. latifolia*. A woodland plant.

v. *vectensis* T. and T. A. Stephenson. Usually shorter than the last, 3 dm. or less, very slender, with rather narrow, greyish-green leaves, flowers with lip-point not recurved and slender petals and sepals. Only known as yet in woodland in the Isle of Wight.

In the two first vars. the ovaries are nearly glabrous, and in the third quite glabrous.

It may also be noted that *E. microphylla* Sw., a continental species with very small, narrow leaves, is also adapted for self-fertilisation. See Darwin, *Fertilisation of Orchids*, 102-3.

2. The reproductive organs arranged for cross-fertilisation. The rostellum is very distinct and prominent.

E. PALUSTRIS Sw.

The lip is much longer than the sepals, and is hinged, so that the distal segment sinks down when an insect alights on it. It is frilled and pure white, with narrow, prominent lip-bosses, the whole spike broad, the leaves narrow-lanceolate. The ovary is roughly hairy. A plant of wet, marshy places and damp sands near the sea, very distinct from the other forms.

E. LATIFOLIA Sw.

Exceedingly variable. When a plant cannot be accurately traced to one of the other species, it may safely be placed here. The size of the whole plant varies much, also the size and shape of the leaves, which may be nearly all at the base of the stem or may clothe it up to the flower-spike. They may grade gradually into bracts or not. The flowers may be anything in colour from green to dark purple, the lip-bosses two or three, rough or smooth, the tip recurved or not. The ovaries vary from almost glabrous to hairy, but never thickly hairy as in the case of *palustris* or *atropurpurea*. The plant grows about the margins of woods and seems to love dusty roadside hedges.

E. PURPURATA Sm.

This plant is usually found with clustered stems, which is a rare feature with *E. latifolia*. Its leaves are much smaller than the last and finer in texture, grading evenly into bracts. The whole stem and leaves are usually suffused with violet or grey-violet. The lip is greenish-white with lilac lip-bosses and the tip often not recurved, the petals whitish-green, and the sepals darker green. At least these characters belong to all the specimens we have seen. The ovaries are almost glabrous. A woodland plant much rarer than *E. latifolia*, and once seen easily distinguished.

E. ATROPURPUREA Raf. (*E. ovalis* Bab.).

Usually much shorter than the two preceding species, often quite dwarf, flowers deep red or yellowish-green, with very rugose lip-bosses, usually three, but sometimes two, the lowest leaves oval and usually rich purple beneath, the pedicels and ovaries densely hairy. A rare plant growing on exposed limestone ledges.

E. media of Babington, as treated in British floras, is now proved to be a mixture of *E. latifolia* and *E. viridiflora*, and must be dropped entirely. *E. media* of Fries, to which Babington assigned a plant which was really *E. viridiflora*, is a mixture of three species, and must also be discarded altogether. *E. atroviridis* Linton is also quite certainly nothing but a form of *E. latifolia*. Some varieties have been named, as var. *platyphylla* (of *media*) and var. *angustifolia* (of *latifolia*), also a hybrid of *E. latifolia* and *E. atropurpurea*, as *E. Crowtheri*. All these names are assigned by Dr Druce.

Rev. T. STEPHENSON, D.D., and
T. A. STEPHENSON, M.Sc.

As I use the generic name *Helleborine* the foregoing plants would be grouped in my *List* as :—

H. viridiflora (Reichb.), var. *dunensis* (T. and T. A. Stephenson) ; var. *leptochila* (Godfery) ; var. *vectensis* (T. and T. A. Stephenson).

H. latifolia Druce, with var. or sub-var. *angustifolia* Druce ; hybrid with *H. atropurpurea* = × *H. Crowtheri* Druce.

H. palustris Schrank and var. *ericetorum* (A. and G.).

H. purpurata (Sm.) Druce.

H. atropurpurea (Raf.) Druce.

H. or *E. media* sinks in synonymy and with it the variety *platyphylla*. G. C. DRUCE.

2316. HELLEBORINE LATIFOLIA Druce. Under the generic name *Epipactis*, now wisely given up by Lindman, Schinz & Thellung, etc., the Rev. T. and Mr T. A. Stephenson, M.Sc. (*Journal of Botany* 209, 1920), give the result of their examination of what they consider to be five good British species—*palustris*, *atropupurea*, *viridiflora*, *purpurata* and *latifolia*. To this limitation we cordially agree. *E. media* Fries was a compound species having been already properly defined, so the trivial *media* falls to the ground. The character derived from the plicate-rugose bosses, as I have long observed, varies to such an extent as to be untrustworthy for specific definition. This the authors show by some well-drawn figures. If Colonel Godfery's contention (*Journal of Botany* 80, 1919) is correct, the question arises, as *media* Fries sinks, whether Babington's trivial should not be used to designate *viridiflora*, since that, as Colonel Godfery shows, is the original of Babington's *media*. This, however, creates confusion and is scarcely worth the candle. With regard to Linton's *atroviridis*, I quite agree with the conclusions of the authors against it being considered a species. In the *List* (1908) I put it as a variety, if indeed it deserves that grade, of *latifolia*. A good definition of *viridiflora* is given. It is a self-fertilising species, and therefore has little or no rostellum. In *Journal of Botany* 33, 1920, Colonel Godfery gives (under *Epipactis*) drawings of the flowers and ovaries of *H. viridiflora*, *latifolia*, and *violacea* = *purpurata*, and a description of the var. *leptochila*.

2324. ORCHIS MORIO L., forma CHURCHILLII mihi. In the marshy pastures to the east of St Ouen's Pond, Jersey, on the Poisson d'Avril of this year, I was struck by the appearance of a showy-looking Orchid which at a distance seemed to be *laxiflora* or its hybrid, a date unusually early for *laxiflora* to blossom. My young companion was not deterred by the wet marsh and soon brought me specimens, which showed that they were neither *laxiflora* nor *alata* but a showy form of *morio*. We subsequently found it in considerable quantity and extending into several fields. The plants were fairly uniform in character and were larger and handsomer than the plant of the cowslip pastures of our Midland counties. The differences seem to be those of degree rather of any essential character. I therefore propose to call it *forma* and name it after my fellow-traveller as an incentive to him to pursue his botanical work. The plants are stout and up to 10 cm. high, the stems thick and succulent; the inflorescence is as much as 3 cm. long; the flowers are quite handsome, the conspicuous labellum being 10-13 mm. broad (Somerset *morio* was 8-10), the middle lobe often markedly truncate (unlike that of *alata*) and then shorter than the lateral lobes. That it is not a mere seasonal freak is evidenced by its being represented in J. Piquet's herbarium as long ago as 1850, while there are specimens gathered more recently by him at La Moye. G. C. DRUCE.

2326 (2). O. PRAETERMISSA, var. PULCHELLA Druce in Gard. Chron. i., 76, 1920. Distinguished from *praetermissa* by the brighter colour (in whichever shade), the smaller labellum which is more angled on the lateral margin, and in its usually smaller size. Common in the north—Shetland, Orkney, Caithness, Sutherland, Ross, Inverness, etc. G. C. DRUCE.

2326 (3). O. PURPURELLA Stephens. in Journal of Botany 164, 1920. *O. cruenta* Rolfe, ? Mueller. The authors have sent a reprint of their paper. They say their plant differs from my variety *pulchella*, inter alia, by having the leaves spotted and the stems more than half solid. From *praetermissa* it differs in the lip being more angled and in the spotted leaves, and from *incarnata* in the lip being broader. The Rev. T. Stephenson (*in litt.*) suggests "that you might consider it to be a hybrid of *pulchella* with *maculata*, and indeed the fainter spotted leaves, the markings and the half-solid stem, do indeed to us seem to render such an origin possible." But Mr Stephenson adds that with absolute definiteness he can say that " such an origin is out of the question. There is no *pulchella* anywhere near. In the fields where it grows there are hundreds of specimens, very true to type, of a far more brilliant colour than any other specimens on the ground, obviously healthy and increasing. We have watched them for years. They hybridise with other forms, *i.e.*, *latifolia* and *ericetorum*." I have sent specimens to Prof. Lindman for comparison with Swedish *cruenta*, and he says they are what he would call *cruenta*. We are indebted to the Messrs Stephenson for their careful work and for the beautiful paintings of the details of the life of the British Orchids. It is trusted that the specific character claimed for *purpurella* may be maintained. It is a beautiful plant.

2335. Ophrys apifera × fucifera. This is identified as *O. Botteronii* Chodat. It was found by our members, H. Walker and Major J. W. Harris, between Folkestone and Dover. See *Orchid Review* xxvii., 142, 1920.

2336. O. muscifera Huds. Near Canterbury, Eric Ogden. A monstrosity in which there is a union of petals with the column, and the consequent transformation into a pair of additional antlers. See *Orchid Review* 1920.

2405 (3). Allium fistulosum L. Alien, Siberia. On the sandy mud-flats of Hayling Island, S. Hants, 1920. Mrs Hillard. Named at the British Museum.

2411. Scilla non-scripta L. & H., var. bracteata Druce, forma Stuartiae. In a wood near Malvern, Worcester, April 1920, Mrs C. Urquhart Stuart. This differs from ordinary *bracteata* (which keeps constant in culture), as Mr R. F. Towndrow, who kindly communicated the specimens, says, by the bracts being foliaceous, not coloured. G. C. Druce.

2416. Lilium Martagon L. See Prof. R. Chodat in *Bull. Bot. Soc. Gener.* 50, 1919, on La Floraison du *Lilium Martagon*.

2440. Juncus Gerardi Lois., forma gracilis mihi. The Knab, Lerwick, 1920. Plant tall, slender, with long narrow leaves, 12-14 in.; inflorescence few-flowered, overtopped by the long bract; capsule longer than type. The plant requires further study, as a nearly similar plant was found by Beeby at Quayfirth, North Maven. G. C. Druce.

2489. Potamogeton alpinus × gramineus = × P. nericius Hagst. In the River Don, at Alford, ~~N~~. Aberdeen, with both parents. S
See *Report* 403, 1918, where I suggested some plants were this hybrid. Dr Hagström now names them as above. G. C. Druce.

2493. P. gramineus L., var. lacustris Fr. Tingwall Loch Shetland, 1920. G. C. Druce.

2495. P. NITENS Web., var. SUBINTERMEDIUS Hagstr. Loch Stenness, Orkney, 1920, G. C. DRUCE, R. J. BURDON, and Col. H. H. JOHNSTON.

2498. P. PERFOLIATUS L., forma OVATIFOLIUS M. & K. Teviot, below Roxburgh, 1912, J. R. MATTHEW ; Cherwell, Oxford, 1885, and Abingdon, Berks, G. C. DRUCE.

2502. P. PERFOLIATUS L., var. GRACILIS Ch. & Schl., forma LANCEOLATA Blytt. Mill-lade, near Selkirk, 1912. Named var. *Richardsonii* by Arthur Bennett, but that plant is, as yet, unknown for Britain ; teste HAGSTROM. See *Report* 291, 1912.

2508. P. PANORMITANUS Biv. Ditch near the sea in Wolverton Parish, W. Norfolk, 1884, G. C. DRUCE. The earliest determined British specimen. See *Report* 114, 1884.

Var. MINOR Hagstr. Southill Park, Bedford, 1913, J. E. LITTLE, as *pusillus*.

2508. P. PUSILLUS L. × P. TRICHOIDES = P. FRANCONICUS Fischer. Marsh Gibbon, Bucks. 1913 ; Buckendon, Norfolk ; Swainsthorpe, W. Norfolk, 1919 ; Bressingdon, E. Suffolk, 1883, G. C. DRUCE ; White Water, near Warnborough, N. Hants, 1897. Miss C. E. PALMER ; Peterborough and Mason's Drain, Northants, 1909, G. C. DRUCE ; Marden, W. Kent, as *Berchtoldi*, E. S. MARSHALL (see *Report* 425, 1893) ; Wytham, Berks, 1918, G. C. DRUCE.

2508. × P. TRINERVIUS Fischer = P. PANORMITANUS × TRICHOIDES. Swainsthorpe, W. Norfolk, DRUCE ; Aberarth, Cardigan [Ref. No. 2278], E. S. MARSHALL. Named by Hagström.

2508 (3). × P. STURROCKII Benn. = P. OBTUSIFOLIUS × PANORMITANUS Hagstr. In the canal near Stroud, Gloster, June 1900, G. C. DRUCE ; teste HAGSTROM.

2512. P. PECTINATUS L., var. DIFFUSUS Hagstr., forma PINGUIS Tis. Thames, near Eynsham, Oxon and Berks, 1920. This I have previously referred to *interruptus* Kit. To me it seems specifically distinct from *pectinatus*. The lower portion of the plant differs greatly from the upper. G. C. DRUCE.

2513. P. SUECICUS = FILIFORMIS × PECTINATUS, var. INTERMEDIUS Hagström, nov. forma PECTINATIOIDES Hagstr., *in litt.* *P. vaginatus* Bennett, not of Turczaninow. This comes from Tingwall and the Asta Loch, Shetland, the locus classicus for *P. vaginatus*, as named by Bennett, where it was found by W. H. Beeby. See *Ann. Scot. Nat. Hist.* 235, 1907, and *Rep. B.E.C.* 702, 1919. In 1920, with Prebendary Burdon, three visits were paid to these lochs, and a careful search revealed no true *vaginatus*. A curious plant was, however, found stranded on the shores of both lochs and a little *in situ*. It was barren. I have compared it with the *P. vaginatus* of Beeby in *Herb. Hume* and find they are identical. All the gatherings sent to Dr J. Hagström, were named as above. On our present information *P. vaginatus* may be deleted from our *List*. It may be recalled that Dr Hagström in his recent work on Pondweeds queried the correctness of the Shetland identification, since *vaginatus* was not found in Scandinavia, Iceland or Greenland, and does not extend south of the 60th parallel. A still more unlikely locality was that of Anglesey (*Rep. B.E.C.* 313, 1890). *Vaginatus* and *Berchtoldi* therefore disappear from our *List*. G. C. DRUCE.

2527 (3). CYPERUS CONGESTUS Vahl. *Mariscus congestus* C. B. Clarke. Bradford, Yorks, 1918, J. CRYER. See *Report* 528, 1918. Det. A. THELLUNG.

2529. ELEOCHARIS MAMILLATA H. Lindberg fil. It is thought this copy of Lindberg's description of the plant closely allied to *palustris* might induce members to search for it in Britain. It was found in " Fennia. Savonia borealis," and " in fossa limosa prope Jorois, August, 1902." The plant, which has hitherto been recognised in the North as *Scirpus* or *Eleocharis palustris*, consists of two entirely distinct species, viz., *Eleocharis* (*Scirpus*) *eupalustris* and *E. mamillata*. They may be distinguished by the following characters:—*Eleocharis eupalustris* mihi. Stem dark green, firm, with about 20 vascular bundles, with palisade cells all round. Fruit egg-shaped, with four bristles or none, the bristles with short appendages. Base of style elongated, clearly constricted. *Eleocharis mamillata* mihi. Stem bright green, soft, with about 12 vascular bundles, with palisade cells only above the vascular bundles, distinctly furrowed when dry. Fruit almost round, with 5-6 (8) bristles, the bristles with long appendages. Base of style low, mamillate.

2531 (2). E. TRIANGULARIS Reinsch., n. sp. Germania. Bavaria. In uliginosis prope Erlangen, 260 m.s.m. Iunio et Augusto 1902. This new species differs but little in habit from its nearest ally, *E. acicularis* (L.) R. Br. Very constant distinctive characters, however, are found in the structure of the stem, especially with respect to the number of the vascular bundles and longitudinal air-cavities :—

E. triangularis—Transverse section of stem with three central air-cavities. Vascular bundles three (parietal).

E. acicularis—Transverse section of stem with four central air-cavities. Vascular bundles four (parietal).

The outline of the section varies to some extent in both species. *E. triangularis* is about Erlangen the more frequent form, having an almost equal-sided triangular outline. In *E. acicularis* the outline is rectangular, six-sided, or even almost ellipsoid. This plant should be sought for in Britain.

2551. ERIOPHORUM ALPINUM L. In answer to my enquiry, which has been suggested by a note in the *Gardeners' Chronicle*, Mr W. Stansfield tells me he found it in 1900 in the company of Mr Foggitt, he thinks, between Glen Phee and Little Tom Buidhe, or somewhere in that area. The specimens were enclosed with several rare Grampian plants to a Mr Cockshott, a surgeon of Strangeways, Salford, who has now been dead many years. He it was who identified it. Unless *Scirpus caespitosus*, which, in that area has often conspicuous bristles, is mistaken for it, this statement of Mr Stansfield's, for which I am greatly indebted—may he live long to enjoy his retirement—suggests the advisability of a systematic search for this extinct British species! It is scarcely likely to have escaped the eyes of Mr and Mrs Corstorphine, who know that ground well.

2559. CAREX RIPARIA, var. GRACILIS, in Britain. In July, 1914, Mr E. Thurston, C.I.E., who lately presented his fine herbarium of Cornish plants to Kew (see *K.B.*, 1920, p. 44), collected an interesting sedge in the Gunwalloe Valley, Cornwall. After careful investigation it has been concluded that the earliest name applicable to this plant is *Carex riparia* Curt., var. β *gracilis* Coss. et Germ. Flore de Paris, 1845, p. 605, where the following description is given: "Tiges presque lisses sur les angles. Feuilles souvent vertes. Epis mâles solitaires ou géminés. Epis femelles laxiflores, longuement pédonculés, souvent pendants. Utricles longuement dépassés par les écailles. Ecailles très longuement cuspidées-aristées.—A. R.—endroits marécageux ombragés.—Corbeil! Mennecy! La cour de France! &c." The variety is kept up by Husnot, *Cypéracées de France*, p. 54 (1905-06), but Roüy et Foucaud *Fl. de France*, vol. 13, p. 486 (1912) make it a synonym of var. *gracilescens* Hartm., ap Anderss., sub-var. *aristata* Rouy et Fouc. *Carex riparia*, var. *gracilescens* Hartm., has been considered by some authors the hybrid *C. riparia* × *vesicaria* (see J. G. Laurell in *Allg. Bot. Zeitschr.* 1900, p. 197). The Cornish plant does not suggest a hybrid nature. Kukenthal (in *Engler Pflanzenr.*, iv., 20, p. 73) apparently considers the var. *gracilescens* Hartm. a mixture, and, not having seen the still earlier description and name of *gracilis* Cosson et Germain, he makes the new combination var. *subgracilescens* for what is apparently the same variety. In the Kew Herbarium a specimen from the Isle of Wight, collected by Dr Bromfield in a wet salt marsh at the mouth of the Wooton creek between Ryde and Cowes, in May 1846, has long peduncles to the female spikes and acuminate glumes longer than the utricles, and must be referred to the var. *gracilis* Coss. et Germ. It is somewhat abnormal in having androgynous spikes. Lastly, a plant referred to in the *Report* for 1915 of the Botanical Society and Exchange Club, p. 379, is the same variety. The following information is there given: "*Carex riparia*, Curt., forma. Tickenham Moor, N. Somerset, v.-c. 6, June 5, 1915. Growing in an open rhine, free from shade."—Miss Ida M. Roper. "Remarkable for its very long lower peduncles and female glumes."—E. S. Marshall. "A curious and interesting form of *riparia*, exactly analogous to *C. vesicaria* L., var. *pendula* Uechtr. Herb. Cf. Asch & Graeb. in *Syn. Mitt. Fl.* 212, 1903. It may be called f. *pendula*."—A. Bennett. A specimen of thus plant has been seen in the private herbarium of Mr Bruce Jackson, A.L.S. W. B. TURRILL in the *Kew Bulletin*, No. 4, 1920.

2619. C. DIANDRA Schrank. Moss of Durkadale, Orkney, August 1920, R. J. BURDON, G. C. DRUCE, and Col. H. H. JOHNSTON. The fruits of this differ from typical *diandra* and are exactly similar, teste D. Lumb, as are the nuts, to Gibson's plant from Seaman's Moss Pits.

[2619. C. DIANDRA × PANICULATA at Lomma Skane, Sweden, differs from the original German hybrid. O. R. Holmberg in *Bot. Not.* 249, 1918. This should be looked for in Britain, where the species grow together.]

2645. ZEA MAYS L. The origin of this plant has been for a long period a theme for discussion, *Euchlaena mexicana* being the most probable. J. Kuwada (*Journ. Coll. Sc. Imp. Univ. Tokio* xxxix., 10) in a valuable research supports the view of Collins that Maize is a hybrid of the above with some species of Andropogoneae. There are ten pairs of chromosomes in the nucleus of *Euchlaena* Maize and species of *Andropogon*; they are longer than those of *Andropogon*, and in Maize the length varies. Each pair consists generally of a longer and shorter chromosome. Kuwada thinks that, as in some races of Maize the chromosomes number not ten but eleven or twelve, it may be conjectured that the great variation exhibited by Maize may be in part due to mutations of which the increased numbers of chromosomes is an indication. One need not wonder at its variation considering its very remote cultivation, which is probably even longer than that of Wheat. There is an unpublished monograph in the Gay MSS. at Kew.

2687 (2). AGROSTIS PALLIDA DC. & Lam. Fl. Fr. Suppl. 251, 1815, non Willd. Alien, Portugal, S. Europe. Leith Docks, Midlothian, 1920, J. FRASER & R. GRIERSON.

2689 (3). A. ERIANTHA Hackel in Viert. Nat. Ges. Zur. xlix., 172. Alien, South Africa. Bradford, York, J. CRYER. Named at Kew.

Gen. 658 (2). DICHELACHNE Endl. Prod. Fl. Ins. Norf. 20, 1833.

2701 (5). D. CRINITA (L. f.) Hook. f. Fl. Nov. Zey. i., 293. Alien, New Zealand, Australia. Netherdale, banks of Gala, Selkirk, September 1916, I. M. HAYWARD. An addition to the plants in the *Adventive Flora of Tweedside.*

2705 (2). AIRA PROVINCIALIS Jord. Pugill. 112. *Avena provincialis* Nym. Alien, Leith Docks, Midlothian, 1903, JAMES FRASER. In *Ind. Kew* this is merged with *A. capillaris* Host, but Coste and Rouy keep it as a distinct species, the latter author indeed putting it in a separate section from *capillaris*. He says it is exclusively a French species, growing in sandy places along the Mediterranean and occuring at St Florent, &c., in Corsica.

2706 (3). A. CUPANIANA Guss. Fl. Sic. i., 145. Alien, Portugal, Spain, France, Italy, Corsica, Sardinia, Tunis, Algeria, Marocco. Leith Docks, Midlothian, October 1920, JAMES FRASER. Allied to *A. caryophyllea*, with which it is combined in *Ind. Kew.* but kept distinct by Grenier & Godron, Rouy, Coste, and Nyman. It differs mainly in its truncate, mucronate, obtuse, denticulate glumes. Rouy places stress on the top of the peduncle being thickened into a ring, whereas in *caryophyllea* it is merely thickened. This character appears scarcely sufficiently constant in examples I have examined. Coste lays stress on the shorter peduncles of *Cupaniana* and the somewhat smaller spikelet. I have gathered it at Hyères and Ajaccio. G. C. DRUCE.

2714. HOLCUS LANATUS L., forma DIFFUSA mihi. In the Island of Hoy, as well as in other places on Pomona in the Orkneys, the Yorkshire Fog occurred with a panicle much more lax and diffuse than the common British form, July and August 1920, G. C. DRUCE.

2714 (2). H. SETOSUS Trin. in Mem. Ac. Petersb. ser. v., vi., ii., 87, 1840. *H. setiglumis* Boiss. & Reut. *H. annuus* Salzm. Alien, Spain, North Africa. Leith, Midlothian. J. FRASER.

2742. KOELERIA ALBESCENS DC., var. GLABRA DC., forma DOLICHOPHYLLA Domin, *in litt.* Foliis infimis innovationumque elongatis culmos cum paniculis manifeste superantibus excellens, glabriflora.

Forma PUBIGLUMIS Domin, f. nova, *in litt.* Glumis glumellisque pubescenti-hirsutis excellens. St Cyrus, Kincardine. G. C. DRUCE.

2785. FESTUCA RUBRA L., near Cardiff, W. O. HOWARTH, M.Sc., in the *New Phytol.* xviii., 263-286, 1919, with 14 figs. In this carefully prepared paper Mr Howarth describes three forms which he has had under investigation. One is *grandiflora*, from Dr Trow's garden; the second, from Shepstow, is *glaucescens*; and the third, which is glaucous-green with smooth rachides, is from the Barry pebble-ridge. This he names sub-var. *tenuifolia*. Elatior: folia innovationum mollia setacea (0.8 mm. diam.), obscure glauco-viridia vaginae hispidulae; panicula densiuscula (9 cm. long), spiculae magnae (2 mm. longae); glumae fertiles 5-7 mm. longae, breviuslongius aristatae. It grows (i.) in the salt-marsh, . . . associated with typical halophytes; (ii.) on the pebble-ridge with xerophytes; (iii.) on hard exposed rocks in scanty soil, calcareous and well-drained; and (iv.) on the calcareous tufa of the cliff-face. The comparative morphology, anatomy, and histology are given of the three forms, which Mr Howarth says, are quite stable, distinct in both vegetative and floral characters, and in choice of habitat. This might well call for their being raised to varietal rank, and supports my contention that comparative cultivation will greatly increase the number of varieties. In the *Journal of Ecology* vii., 216, 1920, Mr Howarth gives notes on the habitats and ecological characters of the above plants.

2868. EQUISETUM ARVENSE L., var. PSEUDOSILVATICUM Milde. Roadside near Waverley, Surrey, 1920 [Ref. No. 2253], C. E. BRITTON. Rouy (*Fl. Fr.* xiv., 495) says like *nemorosum* but "rameaux plus allongés, longuement rameux et à rameaux secondaires 5-gones." In this specimen the branches are somewhat shorter than in *nemorosum*.

2885 (2). ASPLENIUM ONOPTERIS L. As *A. Adiantum nigrum*, var. *acutum* Poll., Mr R. L. Praeger (*Irish Nat.* 13, 1919) publishes a forma *lineare* (which is type *Onopteris*) and f. *ovatum*. The latter is the plant figured by Moore in *Nature Printed Ferns*, t. xxxvii., B. from a plant collected at Killarney by Dr Allchin, of which I possess an original frond. It is the commoner form in Ireland, occurring, Mr Praeger says, at Lough Hyne, Schull, Co. Cork; Snowhill, Kilkenny, Newtonards, Co. Down. The true *Onopteris* (*acutum* Bory)

I have from Rozel, Jersey. A Berkshire specimen from between Lucky and Wokingham Praeger puts to *Adiantum nigrum*, but it is well on the way to *lineare*.

2927 (3). LYCOPODIUM CHAMAECYPARISSUS A. Braun. See *Report* iv., 222, 1915. In that place I mentioned the existence in Mr C. Bailey's herbarium of a specimen of the above plant, labelled *L. alpinum*, on a sheet with true *alpinum* from Ingleborough Hill, 1816, H. S. As yet no corroboration has come to hand, but recently some evidence bearing upon the record has come into my possession. Major Gambier-Parry has kindly given me a herbarium collected by J. Ansell of Hertford. In it is a sheet labelled *Lycopodium alpinum*, Ingleborough Hill, Yorkshire, 1810, which also has on it a fruiting specimen of *L. Chamaecyparissus*, which adds additional value to the above record. I venture to suggest that the H. S. in *Herb. Bailey* is Henry Shepherd, a curator of the Liverpool Botanic Garden in 1836 and nephew of John Shepherd, the discoverer of *Centaurium latifolium* in 1803. The handwriting is, I believe, identical with that on a label of *Centaurium latifolium* collected in 1839 (John died in 1836), so that both specimens were probably collected by him. I am afraid he sometimes sent specimens from the Botanic Gardens as if they were from native situations, and it may be that both species grew in the garden, but the date 1810 is 26 years before he became curator and 6 years before the specimen in *Herb. Bailey* was gathered. Shepherd's herbarium was formerly preserved, or rather stored, at the Botanical Gardens. Mr J. Wheldon kindly tells me that it has now been removed to the Liverpool Museum. The specimens were much damaged, so that many plants had to be destroyed. It contains now, Mr Wheldon says, no *L. alpinum* from Ingleborough. The duplicated specimens of a different date strengthen the making a special search on Ingleborough very desirable. G. C. DRUCE.

REVIEWS AND NOTES ON PUBLICATIONS, NEW BOOKS, ETC., 1920.

(*Owing to exigencies of space much material has had to be omitted. The issue of Botanical Abstracts (see p. 61) will, however, render these less necessary.*)

ALLEN, PAUL. New Chenopodium Hybrids. Rep. Sp. Nov. 15, 177, 1918. The following are included :—*C. album* × *leptophyllum* = *C. leptophylliforme* and var. *glabrum*; *C. hircinum* × *leptophyllum* = *C. pseudoleptophyllum*; *C. Binsianum*, var. *acutum*; (*C. hircinum* × *striatum*) × *album* = *C. Haywardiae* × *album*. This he calls × *C. basiliense*.

ARBER, AGNES, D.Sc. WATER PLANTS, A STUDY OF AQUATIC ANGIOSPERMS. pp. 436. tt. 172, 1920. Camb. Univ. Press; 31/6.

ARCHANGELI, GIOVANNI. On *Diospyros Kaki*, var. *Lycopersicum* in Bull. Soc. Tosc. Ortic. xliv., 1919.

BABCOCK, ERNEST B. *Crepis*: a Promising Genus for Genetic Investigations. American Naturalist 270, 1920.

BABCOCK, ERNEST B., and COLLINS, JULIUS L. Interspecific Hybrids in *Crepis capillaris* Wallr. and *C. tectorum* L. Univ. of Calif. publications in Agr. Sciences ii., 191, 205, 1920. *Crepis* species are known to possess low chromosome numbers, and the writers have given genetic investigation to these two species, *tectorum* having one more pair of chromosomes than *capillaris* the latter having only three pairs. The two species were crossed, one method being to emasculate the female parent flowers, the other to wash the female plant free of pollen by the use of a fine jet of water. The latter method was used when the *capillaris* plant was shown to be self-sterile. These closely allied species differ in the size of the achenes. Those of *tectorum* range from 3.5 to 4 mm. in length, those of *capillaris* from 2.0 to 2.5 mm. The cotyledons of *capillaris* are approximately 5 mm. wide and 4 to 6 mm. long, those of *tectorum* are narrower, ranging in length around 6 mm., while they are only about 3 mm. wide. The results of culture experiments are given.

BALFOUR, Prof. I. B. New Species of Rhododendrons. Notes from the Royal Botanical Garden, Edinburgh, lii-lix. Forty new species, chiefly from China, are described: they are the Rubi of the East.

BEVIS, J. F., B.A., B.Sc., and JEFFERY, H. J., A.R.C.Sc., F.L.S. BRITISH PLANTS: THEIR BIOLOGY AND ECOLOGY. pp. vi., 346, tt. 115. Second edition. Methuen & Co., London, 1920: 7/6. The book is divided into three parts. (1) Fundamental ecological considerations—water, temperature, light, air and soil. (2) A general description of British plants examined in the light of these factors and considered as an outcome and expression of them. (3) The physiognomy of the British flora in its most conspicuous associations to explain its origin and development, and to analyse its present distribution. In treating of the Environment and its influence upon vegetation ten chapters are occupied, and the student must be a dull one who fails to obtain a good general idea of the subjects discussed. Eight chapters are devoted to Plant Biology, which is equally well treated. Twelve chapters are occupied in treating of the third of the subjects alluded to above. To account for the great wealth of variation it is stated two theories are possible, the " Special Creation " and the " Evolution," and that only the latter can account for the facts. This seems somewhat bald, and so far as the second " and only possible one " may demand some future modification. The Darwinian theory of the accumulation of minute differences which eventually produce a new species is contrasted with De Vries' Mutation Theory, the latter of which is suggested to be the more probable. " The peach is regarded as a mutation of the almond, the nectarine is undoubtedly a mutation of the peach." In treating of the origin of the British Flora the generally accepted explanation of its coming after the Ice Age from the Continent is given and the scales are held evenly between the different views relating to the presence of the Lusitanian element in our flora. Regarding the rarity or absence of endemic species in Britain it may be stated that while *Oenanthe fluviatilis* occurs in

Germany and Denmark, there are some Rubi and several Hieracia not yet known to occur on the Continent, and a closer study of micro-species will doubtless increase the number of endemic forms. Of eight forms of *Taraxacum* sent by the writer to Dahlstedt not one was identical with any of the three hundred species known from Scandinavia. Another Lusitanian species might be added—that of the recently-discovered *Centaurium scilloides*, var. *portense*. *Simethis bicolor* is not, as stated, found in Devon, but Dorset, to which county it probably came in recent times. If the standard of specific distinction be that of " always breeding true from seed," the number of species would not be lessened. The "bewildering multitude" of Hieracia would probably in most cases stand that test. So, too, would many more colour varieties. It is already known that *Geranium lancastriense* remains fairly constant under changed conditions. The whole matter cannot be easily answered. For instance, the authors say that " in the West of Ireland there grow together two saxifrages—*S. umbrosa* and *S. Geum*. According to Babington they are distinct species. According to Clement Reid they are divergent forms, for he saw growing among them a nearly complete series of intermediate forms." Bentham made a similar remark about the Primrose and Cowslip. Equally erroneous statements have been made about *Geum rivale* and *G. urbanum*. The fact is that the observations were correct but wrong deductions were drawn. *S. Geum* and *umbrosa*, *Primula veris* and *vulgaris*, *Geum rivale* and *urbanum* are pairs of distinct species, but where they grow together they readily hybridise, and their hybrid offspring make a chain of intermediates. Where *G. urbanum* grows away from *rivale* intermediates do not occur. The chapters on Ecology abound with interesting material. One may add that the Lizard Orchid is not confined to Kent. *Sagina Boydii* might well have been omitted. Evidence is lacking for the occurrence of *Saxifraga caespitosa* in Westmorland, nor is there scientific evidence of the occurrence of *Cochlearia groenlandica* on a mountain cliff anywhere in Britain. *Silene acaulis* and *Thalictrum alpinum* might have been cited as examples of alpine plants occurring on the sea coast. But these are minor points, and we can commend the book as being eminently useful. An additional claim for gratitude is the Bibliography and the epitome of the Mendelian Theory in the Appendices.

BLAKE, S. F. Directions for Collecting Flowering Plants and Ferns. U.S.A. Dept. of Agriculture Circ. No. 76, 1920. This excellent pamphlet of 8 pages can be obtained for five cents from the Government Printing Office, Washington, D.C., U.S.A. As practical points which may be mentioned, it suggests that a vasculum should be painted white, not black, and that corrugated straw-boards are excellent for placing amongst the drying paper.

BLATTER, ETHELBERT. FLORA ARABICA. Ranunculaceae to Moringaceae, p. 1-123, 1919. Record of the Botanical Survey of India. The arrangement is according to Bentham & Hooker. The names *Nasturtium* and *Neslia* are used instead of *Radicula* and *Vogelia.* The distribution and vernacular names are added where possible. The North African Desert and the Mediterranean area afford the chief elements of the flora.

BLATTER, E. with P. F. HALLBERG and C. M'CANN. Contributions to a Flora of Baluchistan, in Journ. Ind. Botany, 1919-20.

BOCCONE, PAULO. His Herbarium at Lyon. See R. Pampanini in Nuovo Gior. Bot. Ital. xxvi., 1-20, 1919.

BOSE, Sir JAGADIS CHUNDER. Research on Growth of Plants, in Nature 615, 648, 1920.

BOTANICAL ABSTRACTS. Williams & Wilkins Company, Baltimore, U.S. Camb. Univ. Press, Fetter Lane, London, E.C. Vol. iii., six parts, January-June; vol. iv., pt. 1, July; vol. v., pt. 1 and 2, August and September; vol. vi., pt. 1 and 2, October and November. These Abstracts are becoming more representative but so far as Britain goes are still inadequate. Our own Reports, which have the largest circulation of any purely Botanical publication in Britain, are not even mentioned, although it has been thought necessary to quote from other sources a paper giving the height of *Cirsium palustre*, an erroneous account of *Barbarea rivularis* and *stricta*, and the exciting record of *Galium erectum* from Somerset, for which county it is already recorded.

BOULENGER, G. A. Some Roses from Dorsetshire, in Journal of Botany 16, 1920.

Bower, Prof. F. O., F.R.S. The Earliest Known Land Flora. Royal Institution Discourse. See Nature 681, 712. 1920. "The morphology of land-living plants is again in the melting-pot." The new facts "link the Bryophytes and the Pteridophytes more closely together than ever before."

Bower, Prof. F. O., F.R.S. Joseph Dalton Hooker, O.M. pp. 62. London, S. P. C. K., 1919; 2/-. A useful account of the great botanist, but we still lack a volume which gives the collector's and explorer's side of his character, nor have his powers as a keen systematist yet received adequate treatment.

Britten, James. Some Early Cape Botanists and Collectors, in Journ. Linn. Soc. xlv., pp. 29-51, 1820. Paul Hermann (1640-98), Oldenland, John Foxe, F. Kiggelaer, F. P. Oldenburg, Andreas Auge, Francis Masson (1741-1805), C. P. Thunberg (1743-1828), William Roxburgh (1751-1815), are among the earliest botanists mentioned in this valuable contribution towards the history of South African Botany. No mention is however made to one of the earliest collectors, Alexander Brown, circa 1700, who sent a large number of plants to Daniel Dubois which are preserved at Oxford.

Britton, N. Lord. A Botanical Expedition to Trinidad, in Journ. New York Bot. Gard. 101, 1920. This gives a most interesting description of his and Mrs Britton's visit in 1920 to that most beautiful island. They brought back a very large gathering of over 2000 field numbers, among which was a new *Hydrocotyle.* I had gathered this in my first visit, but it had remained unnamed. They saw that curious terrestrial Bladderwort *Arcylium* in the Northern Mountain Reserve, growing on wet banks. There, too, a slender, climbing bamboo-grass ascends trees, and there is a yellow-flowered, high-climbing *Senecio.* The flora of that region is very rich. They also visited the fine Mora Forest, where the Balata rubber trees are wonderful objects, as well as others, such as *Dimorphoandra excelsa*, a gregarious species. In their recent visit to Oxford, all too short as it was, they not only named many of my gatherings but pleasant recollections of that rich botanical hunting ground were revived, and we shall await with interest the publication of the results obtained.

BRITTON, N. LORD, and ROSE, J. N. THE CACTACEAE. Descriptions and illustrations of the Cactus Family. Vol. i., pp. 236, 36 col. plates, 301 text figures; vol. ii., pp. 237, 40 col. plates, 305 text figures, September 1920. A very costly work issued by the Carnegie Institute. The figures are excellent.

BRITTON, N. LORD, and MILLSPAUGH, C. F. THE FLORA OF BAHAMA. 8vo., pp. 695. Ackerman. Lorillard Mansion. Bronx Park. New York City; 6 dollars 25 cents. The volume includes. with the cellular Cryptogams, 1952 species, of which 185 are supposed to be endemic. The Bahama includes 29 islands and very many isolated rocks, with a land surface of 4424 square miles.

BROWN, N. E. New and Old Species of *Mesembryanthemum*. Journ. Linn. Soc. xlv., 53-140. tt. 6. 1920. This important paper lacks an index.

BROWNE, Lady ISABEL M. P. A third Contribution to our Knowledge of the Anatomy of the Cone and Fertile Stem of *Equisetum*. Ann. Bot. xxxiv., 237-263. 1920. Phylogenetic Considerations of the Internodal Vascular Strands of *Equisetum*. New Phytologist xix., 11-25, 1920.

CHEESMAN, W. N., F.L.S. A SPRIG OF ACACIA. This brochure treats of the Acacia as an emblem in Masonry and directs attention to its being often represented by the False Acacia. *Robinia Pseud-Acacia*, whereas *Acacia arabica* should be the one depicted.

CLEMENTS. F. F. PLANT INDICATORS: The Relation of Plant Communities to Process and Practice. pp. xvi., 388. tt. 92. Carnegie Institute. Washington. No. 290. 1920: 7 dollars. The species *Mertensia* [*Pneumaria*] *sibirica* is indicative of the condition "deep shade" in Colorado. and every plant is an indicator of conditions, processes or uses. It has been long recognised that certain species in Britain are indicative of certain soils. The weakness of ecologists often lies in their ignoring the *variations* of species. An intensive study of British grasses will almost certainly lead to finding that many of them are good soil-indicators. As we know, *Rumex Acetosella* is of acid soils, and *Polygala calcarea* is of limestone and chalk.

Cockayne, L., F.R.S., Director, Dominion Museum, Wellington. N.Z. New Zealand Plants and their Story. Ed. 2, 7/6. Although called a second edition, the work has practically been rewritten.

Collins, Julius L. Inbreeding and Crossbreeding in *Crepis capillaris* Wallr. Univ. Calif. Agr. Publ. ii., 205-16, 1920. Pollen sterility is one of the results of inbreeding and one plant in a third generation culture produced almost no pollen. "Inbreeding in a naturally cross-fertilised wild plant causes conditions in many ways similar to the conditions produced by inbreeding in maize. The maximum reduction appears to be in the third and fourth generations. Crossing inbred strains with non-inbred strains produces vigorous, rapidly growing plants. Increased size of pots and quantity of soil did not affect the relationship of vigour and of growth." We hope the author will go on to experiment with the different varieties of *C. capillaris.* It is quite possible that some may be specifically distinct. Bentham united *tectorum* and *capillaris* and yet modern researches have shown they possess a different number of chromosomes.

Coltman-Rogers, Charles. Conifers and their Characteristics. John Murray & Son, 1920; 21/-.

Church, Dr A. H. Elementary Notes on Coniferae. Bot. Mem. No. 8, 1920. Form Factors in Coniferae, *l.c.*, No. 9, 1920.

Dale, Samuel. A Memoir, by Miller Christie, appears in the Essex Naturalist for 1920; also a paper by P. Thompson on an annoted copy of *Plantae Woodfordiensis.* Warner's own copy with notes is in Wadham College Library, Oxford.

Drabble, Dr E. Notes on the Fauna and Flora of N.E. Derbyshire. Naturalist 10, 1919; 11, 1920.

Druce, George Claridge, LL.D. Lizard Orchis and other Rare Plants in Britain. Gard. Chron. ii., 235, 1920. *Plantago Cynops*, etc., in Britain, *l.c.* 259, 265. *Orchis praetermissa*, var. *pulchella* Druce, *l.c.* i., 77, 1920.

DYMES, T. A. THE NATURE STUDY OF PLANTS IN THEORY AND PRACTICE FOR THE HOBBY-BOTANIST. pp. 173, 1920. Introduction by Prof. F. E. Weiss. S. P. C. K.; 6/-. Our member has taken the Common Herb Robert for his text, which in a dozen chapters he develops into a well-arranged sermon, leading on from the explanation of Nature Study of Plants to Physiology, questions of Protection, Vegetative Reproduction, Cross Pollination, Wind-dispersal, the manner in which water and animals carry seeds, and the dependence of animals and plants on each other. The tale of each of these subjects is clearly told in simple language and with apt illustration. This forms the prelude of the life-history of *Geranium Robertianum*, which is graphically described and makes pleasant reading, while at the same time it impresses upon the student the necessity of independent and watchful observation. A chapter is devoted to the relations of the Herb Robert, the Cranesbills and Storksbills. Those interested in Nature teaching will assuredly find a stimulus and help in this pleasant volume.

ELLIS, G. S. M. APPLIED BOTANY. pp. viii., 248, tt. 67. Hodder & Stoughton: 4/6.

FAWCETT, W., B.Sc., and RENDLE, A. B., D.Sc. FLORA OF JAMAICA. Vol. iv., Leguminosae to Callitrichaceae; 8vo. pp. xv., 369, 114 text figures, 1920; 25/-. *Sesbania Sesban*, a new comb. It has already been made. See Vines & Druce, *Moris. Herb.* 6, 1914. The name *Pithecolobium* is now changed to *Pithecellobium*.

FERNALD, M. L. *Nymphozanthus* of Richard in Ann. Mus. Par. xvii., 230 [the date of which is given in the Kew Index as 1811], vice *Nuphar*. Rhodora 183-8, 1919. Affords another reason for retaining *Nymphaea* and *Castalia* for the two genera of the Water Lilies. The varieties of *Ranunculus repens*. Rhodora 169, 1919.

FISCHER, C. Preliminary Note on the Flora of the Anaimalais in Journ. and Proc. Asiat. Soc. of Bengal, xiv., 379, 1918.

GAMBLE, J. S. FLORA OF THE PRESIDENCY OF MADRAS. Part 3, pp. 391-575. Adlard & Son; 10/-.

GEDDES, Prof. THE LIFE AND WORK OF SIR JAGADIS C. BOSE. Longmans & Co.; 16/-.

GODFERY, Col. M. J. The Problem of the British Marsh Orchids, in Journal of Botany, 286, 1920. He states that he found *O. latifolia* growing in quantity without other marsh orchids or *maculata* at Vence, Alpes Maritimes, and at Thorenc with *maculata* and the hybrid. He thinks this *latifolia* is identical with the spotted-leaved marsh orchis of Britain. He has never seen ringed spots except in *latifolia* and its hybrids.

GROVES, JAMES, F.L.S., and BULLOCK-WEBSTER, Canon GEORGE. THE BRITISH CHAROPHYTA. Vol. i., Nitelleae; pp. xiv., 142, tt. 20. Published by The Ray Society, 1920. This is one of the most important British botanical monographs which has appeared for many years. This group, difficult as regards its proper definition and so problematical as regards its position in the vegetable kingdom, has been for many years most carefully studied by these authors, not only under the microscope but in its natural surroundings, and they have spared no pains to bring together the information of each species enumerated in this valuable publication. The history of the group is traced. They were first separated by Vaillant in 1719 under the generic name *Chara*. Linnaeus treated them as belonging to the Algae, while Withering put them in the Monoecia section, Monandria, of Flowering Plants. Richard raised them in 1815 to Ordinal rank: Lindley placed them in the Bryophytes; Strasburger in the Thallotypes, whose origin must be looked for in the Chlorophyceae, while Sachs says they are so different from all other classes of plants that they must be erected into a special group by the side of the Thallophyta and Muscineae. Neither Hooker nor Bentham included them in their works on British plants, but Syme and Babington gave them a place after the Lycopods, and in that sequence they are enumerated in the *British Plant List*. As the authors say, they are a very ancient type of vegetation, some palaeontologists asserting that remains have been obtained from the Devonian and Silurian systems. The authors have already worked at remains in the Purbeck beds. The species are world spread, and occur at low levels up to 14,000 feet in the Cordilleras of Peru. They inhabit fresh water and in such as is almost free from mineral contents as well as in water in which there is a large percentage of carbonate of lime. *C. fragilis* is one of the hardiest and most ubiquitous, existing in the cold water of alpine lakes and in the hot springs of Iceland in water which is hot enough to boil an egg in four mintues. Over 50 pages are devoted to the structure and development of the Charas, then follows a conspectus of the distinctive characteristics of the oospores and membranes by which the group is separated into the 5 genera—*Nitella*, *Tolypella*, *Nitellopsis* (which has only one species, *obtusa*), *Lamprothamnium* with *papulosum* as its solitary species, and *Chara*. The first two of these are described in the present volume, leaving the two latter and *Chara* for the ensuing volume. Then follows the necessary glossary and "Adjectival Terms." An interesting systematic account gives the history of the British species, the first record being that in Gerard's Herball of 1633, where two plants are mentioned, both, however, probably referable to *vulgaris*. It may be added that we owe two species, one from Cornwall and the other from Donegal, to the industrious exploration of Canon Bullock-Webster. The authors have retained the four specific names used by Linnaeus, but they add "to attempt to fasten a Linnean name to a modern micro-species of bramble, rose, eyebright," or, it might be added, Water Buttercup, "is to verge on the ridiculous." They wisely reject manuscript names as not entitled to any special consideration. A very useful key to the British Nitellae and Charae is given. There are 10 British species of *Nitella* and 4 of *Tolypella*. In order to retain the earliest trivial, *Nitella capillaris* G. & B.-W. replaces *N. capitata*. This was discovered in Sutton Gault by the late Alfred Fryer, who showed it to the writer there. They name a variety of *N. flexilis* as *Fryeri*, he having found it in Cambridgeshire in 1884. Another of our members, Miss Roper, found the variety of *mucronata* named *gracillima*, and our veteran contributor, Mr J. A. Griffith, found the var. *erythrocarpa* of *Tolypella glomerata* in Llyn Coron in 1887. *T. nidifica* rested on the evidence of an unsatisfactory specimen found by the Rev. E. S. Marshall in a lagoon north of Wexford Harbour in 1896, but it was insufficient to be figured for the work. It was a great delight to find it this August in company with the Rev. Preb. R. J. Burdon and Colonel Halcro Johnston in the Loch of Stenness, Orkney, in a situation so remote from its first habitat. Here it grew in some quantity also in brackish water and to a considerable size, plants over three feet long being observed. They are dreadfully brittle. Fourteen of the beautiful plates are from the pencil of Miss Groves and two of the "Decorations of the Membranes" are by Canon Bullock-Webster. They bear witness that even in the twentieth century fine botanical plates can not only be drawn but produced. Here we have no muddlings up of the drawings of the oospores with the plant, while the details are meticulously correct. We offer the authors the warmest thanks for this eminently satisfactory volume. One point may be alluded to. Charas have in many cases an extremely disagreeable smell, which the authors say some authorities state to be due to sulphuretted hydrogen, and Dr T. F. Allen suggests that this may be protective in character, deterring animals from feeding on them. Bearing on this, one may mention that in the early eighties the Oxford drinking water had an intensely disagreeable smell and taste, which alarmed the population and was attributed to a variety of causes. The smell was, however, to the writer quite definitely that of *Chara*, and an examination of the water supply bore this out. One of the smaller streams had a connection with the reservoir. Normally this was closed against it by a barrier. Occasionally, however, when the supply ran short it was allowed to run on the filter beds. Most injudiciously, the supply was occasionally taken direct from the reservoir. In that year Hog Acre Ditch, the stream mentioned above, was full of *C. vulgaris* and *fragilis*, var. *Hedwigii*. The water had sunk half a foot below the ordinary level, so that masses of *Chara* were exposed to the atmosphere and the odour was intensely disagreeable. At that time I became convinced that a gas was not wholly, if indeed at all, the cause. A foreign chemist stated that the odorous principle was a camphoraceous fat. At the moment, however, I am unable to trace the reference. Of course, such a possible source of pollution was speedily avoided and no similar trouble has since arisen.

HARDY, M. E., D.Sc. THE GEOGRAPHY OF PLANTS. pp. xii., 327. tt. 115. Clarendon Press. 1920; 7/6. Six chapters treat of:—(1) Asia, the greatest of the continents, with its northern shores penetrating far into the polar circle and its southern coast bathed by tropical seas, containing countries of striking contrast, with extremes of aridity in the great deserts, and the greatest rainfall as in Assam. The main features of Asia, such as the moss and lichen tundras, Siberia, Amurea, Korea, Sakhalin, Yezo, Kamchatka, China, Japan, Manchuria, Malay, India, the Indus Desert, Iran, Mesopotamia (once so fertile from the irrigation of the Tigris and Euphrates), the upland country of Asia Minor (a plateau with an average elevation of 3,000 feet, encircled by mountains), Turkestan, the Kirghiz steppes, Mongolia, Tibet and the Pamirs, are tersely given, and the same plan is adopted in (2) North America, (3) South America, (4) Australia, (5) Africa, and (6) Europe. There is a useful geographical index, and Engler and Prantl's system has been taken for the plant names arranged under each continent. So easily do we forget, and, as if the Clarendon Press had not published the *Index Kewensis*, so we notice *Prunus amygdalus* and *Vaccinium Myrtillus*. In fact, the use of capitals is rather haphazard throughout. We do not know *Populus tremulosa* unless it is a misprint for *tremula*. The Cotton is called or miscalled *Glossypium* in two or three places. Does *Stipa tenacissima* occur in Australia (p. 322 and 181)? It is by no means certain that *Fritillaria Meleagris* is the Fritillary of the Russian Steppes. In fact, the plants are evidently less well treated than the geography. The work should, however, be on one's shelves, for in a small space a mass of valuable geographical information is collected.

HARWOOD, E. H. The Maritime Pine Forests of Gascony, in Gard. Chron. ii., 214, 1920. An interesting description of the dunes and of the Pines grown on them.

HEDLUND, T. *Ribes rubrum* L., in Sweden. Bot. Notiser 103, 1919. The author holds that it is native and that the name *R. rubrum* L. should be retained for it and not, as Janczewski suggested, used in another sense.

HENRARD, J. TH. *Galeopsis*, een systematisch-floristische studie, in Nederland Kruidkundig Arch. 158-188, May 1919.

HENRY, AUGUSTINE, M.A. FORESTS, WOODS AND TREES IN RELATION TO HYGIENE. pp. xii., 314, with 50 illustrations. Constable & Co., 1919; 18/-.

HENRY, AUGUSTIN, and HOOD, MAY G. THE HISTORY OF THE DUNKELD HYBRID LARCH, *Larix europaea* × *leptolepis* = × *L. eurolepis* Henry. In the hybrid only the cells on the central part of each surface of the leaf bear papillae; the rest of the epidermal cells are smooth. The hybrid grows with greater vigour than either of its parents.

HILEY, W. E. THE FUNGAL DISEASES OF THE COMMON LARCH. pp. xi., 204. Clarendon Press, Oxford; 12/6.

HITCHCOCK, A. S., and STANDLEY, P. C. THE FLORA OF THE DISTRICTS OF COLUMBIA AND VICINITY. Vol. 21. Contributions from the U.S. National Museum.

HOLMBERG, OTTO R. *Puccianella-Arten* and *Hybriden*, in Bot. Notiser 1920. It is to be regretted that the writer does not consult recent British works on the subject. It would prevent the use of an untenable name in *P. rupestris*, which should be *Puccianella procumbens* if that generic name be used instead of *Glyceria* or *Atropis* The author describes :—(1) *P. distans*; (2) a hybrid, *P. elata* (*Atropis distans* and *suecica*); (3) *P. distans* × *maritima* Holmb. Bot. Not. 254, 1916; (4) *P. maritima* × *retroflexa*; (5) *P. pannonica* = *distans* and *rupestris* (*sic*); (6) *P. Foucaudii* Holmb.: (7) *P. salinaria* (Simonk.) Holmb.; (8) *P. distans* × *salinaria* (Personis) Holmb.; (9) *P. limosa* Schur (Holmb.). The point at once arises as to which is the valid name for this offshoot from the genus *Glyceria*. If the rule holds good that when a genus is divided the original name must go to the genus which has the largest number, then plants belonging to *Atropis* and *Puccianella* would retain the name *Glyceria*. The other section had already been separated by Fabricius as *Panicularia*, but that name has been arbitrarily ruled out by the Actes. The last word on the subject has not yet been said. On p. 95 of the *Bot. Notiser* Holmberg raises the question of the name for the grass known to most botanists as *Glyceria aquatica* Wahlb. Fl. Gott. 1820. He holds that it should be *G. maxima* (Hartm. Handb. 1820) Holmb. The trivial *aquatica* is already in use in *Catabrosa aquatica*—the *Aira aquatica* of L. Presl in 1819 (*Fl. Cech.* 25) transferred *Aira aquatica* L. to *Glyceria* [to which it did not belong]. In 1820 Hartman put both *Catabrosa* and *Glyceria aquatica* into *Molinia* [to which neither belonged], the latter under the name *maxima*, a trivial which Holmberg wishes to revive. Of course, if our reed-grass is a *Molinia* Hartman would be the authority, but as the *Glyceria aquatica* Presl is dead it seems scarcely necessary to alter the present name. *Sagina Linnaei* and its hybrid with *S. procumbens*, in Bot. Notiser 203, 1920. In this paper Holmberg rejects the valid name *S. saginoides*, which retains the original trivial, and holds in opposition to Lindman, Schroeter, and others that *scotica* = *S. Linnaei*. He believes that some of Ostenfeld's gatherings on Ben Lawers are the hybrid. Notes on *Equisetum*, in Bot. Notiser 161, 1920. Includes *E. arvense* × *telmateia*, *E. arvense* × *pratense*, *E. hyemale* × *variegatum*, and *E. scirpioides* × *variegatum*.

HORWOOD, A. R. THE OUTDOOR BOTANIST. A simple manual for the study of British plants in the field. 8vo. pp. 284. 36 plates and figures in the text and six diagrams and maps; 1920: 18/-.

HOWARD, A. L. A MANUAL OF THE TIMBERS OF THE WORLD. pp. xv., 446. Macmillan & Co.; 30/-.

HURST, C. P. East Wiltshire Mosses, Hepatics, and Lichens, from Wilts Archaeological and N. H. Mag. xli., 40. An important list, in which our member's many additions to the flora of the county are given.

HUTCHINSON, J. *Bocconia* and *Macleaya*. A revision of the species, in Kew Bulletin 279, 1920.

JEANPERT, ED. Enumeration de Plantes de Macédoine, in Bull. Mus. Hist. Nat. Par., 1919.

JOHANSSON, K. *Hieracium sylvaticum* forma, in Bot. Notiser 65, 1920.

JOHNSTON, Col. H. H. Additions to the Flora of Orkney, in Trans. Bot. Soc. Edin. 23, 1920. Includes *Cerastium subtetrandrum* and *Galium Mollugo*, var. *Bakeri*, both named by Mr Bennett; *Utricularia major* (flowerless), and *Festuca tenuifolia* Sibth. (!). The Orkney *Zannichellia palustris* is referred to *Z. polycarpa*, var.

tenuissima. Some of the foregoing plants are very critical, and at present I hesitate to pass them.

Jones, W. Neilson, M.A., F.L.S., and Rayner, M.C., D.Sc. A Textbook of Plant Biology. pp. vi., 262. Methuen & Co., London, 1920; 7/-. The writers have ably treated in three parts:—(1) The Plant as a Machine; (2) Reproduction; and (3) The Plant in Relation to the Outside World. Terse and clear directions for practical work follow each section which renders the book of great value to home students if such now exist. The chapter on the Assimilation of Nitrogen by Plants is excellent, that on Enzymes, although very concise, is lucid. The chapter on Soil also contains much valuable matter brought together in a practical form. Of the many books on the subject recently published this is one of the best for the average student.

Keeble, Prof. F. W., C.B.E., Sc.D., F.R.S. Intensive Cultivation. Presidential Address to the Agricultural Section of the British Association meeting at Cardiff.

Kops, Jan van, Eeden, F. W., and Vuyck, L. Flora Batava. The parts published include coloured plates of ***Rubus humifusus*** and *R. caesius*, var. *aquaticus*.

Larter, Miss C. E. Twelfth Report, Botany Committee Devon Association. Includes *Euphrasia foulaensis* Towns., from Moreton Hampstead, but on whose identification? Our Euphrasias in so many instances have been wrongly named that one hesitates about including this very northern plant for Devon.

Le Moore, Spencer. A Contribution to the Flora of Australia, in Journ. Linn. Soc. 159, 1920. A useful key to the Australian species of *Tribulus* is given. A large number of new species are described.

Lewis, F. J., and Tuttle, Gwynethe M. Osmotic Properties of some Plant Cells at Low Temperatures, in Ann. Bot. xxxiv., pp. 405-16, 1920. The Linnean Society Journal 143, 1920, contains an interesting account of a visit to Kunadiyaparawita Mountain in Ceylon by F. Lewis. This curious isolated mountain rises from a high forest to a height of 5186 feet and lies to the west of the still more celebrated Adam's Peak, with which its flora is contrasted.

LESTER-GARLAND, L. V. The Botany of the Maroccan Middle Atlas, in Journal of Botany 97, 1920.

LINTON, E. F., M.A. Re-issue of the FLORA OF BOURNEMOUTH, with an appendix. pp. 287-304, 1920; 5/6.

MARTIN, JOHN N. BOTANY FOR AGRICULTURAL STUDENTS. pp. x., 585. New York: Wiley & Co.; London: Chapman & Hall; 12/6.

M'GILL, J. F. BRITISH GRASSES. M'Gill & Smith, Ayr, 1920. The book contains 65 plates from photographs of specimens of mounted native Grasses. These are very useful in assisting the non-botanical farmer or the book-read student to identify the more common British species, and it can be cordially recommended for the purpose. One knows what stumbling blocks there are in book descriptions to betray the student, so that with these photographs from the actual plants he will be enabled to avoid many of them. Having mastered the more common grasses the others will readily fall into their places. Among the really good photographs *Bromus mollis*, *Dactylis*, *Festuca ovina*, *Nardus*, *Triticum repens* and *Poa trivialis* may be singled out. If another edition, as we hope, is called for, one would suggest the inclusion of the more important synonyms, and a scientific rather than an alphabetical arrangement. We are told that *Poa nemoralis* is an excellent lawn-grass, a fact one hardly realised, although to my sorrow some plants which I brought from Caenlochan and which an expert had named *P. Balfouri* proved to be *nemoralis*, and they seeded most profusely in a dry gravelly loam. *Avena* or, as it should be, *Arrhenatherum elatius*, is said to produce a very good crop of hay, a fact only recently realised by agriculturists. *Festuca rottboellioides* is misspelt, but *Desmazeria loliacea* is a preferable name. *Spartina Townsendi* and *Elymus arenarius* should not be omitted from the next edition, both being useful grasses though not necessarily in an agricultural sense.

MAIDEN, J. H. A CRITICAL REVISION OF THE GENUS EUCALYPTUS. Vol. iv., parts 8 and 9, 1919; pt. 10, 1920; vol. v., parts 1, 2 and 3, 1920. The plates should be compared with the Poplars in the *Cambridge Flora.* W. A. Gullick, Sydney.

MATTHEWS, J. R., M.A., F.L.S. Cheshire Roses, in Journal of Botany 137, 1920. If Dr Boulenger's contention is correct, *R. britannica* Déség. must replace *Jundzilliana* from Moreton.

MATTHEWS, J. R., M.A., F.L.S. Hybridism and Classification in the Genus Rosa, in New Phytologist xix., 153-171, 1920. In this suggestive paper its author correctly asserts that the more intensive study of British plants brings out the recognition of the increasing number of hybrids, and mentions the genus *Viola*, *Epilobium*, *Mentha*, and *Salix*. He might have added *Euphrasia* and *Salicornia*. In the group *arvensis* he gives an example of its variation based on leaf-serration and the nature of the peduncle. (1) Biserrate leaflets (B.), not biserrate (b.); (2) Hispid, glandular or setose peduncles (S.). smooth peduncles (s.). From these the following four theoretical combinations may be expected B.S., B.s., b.S., b.s. *R. arvensis* is B.s., and its smooth peduncled form is *R. erronea*. B.S. corresponds to var. *biserrata*. *R. stylosa* is worked out in a similar way. Out of the eight theoretical combinations five have been found in Britain. With regard to *subcanina*, Mr Matthews asks if it is not a hybrid of *glauca* and *canina*, and if *subcollina* is not a hybrid of *dumetorum* and *coriifolia*. It is noted that in *Eglanteria* only 10 per cent. of pollen was fertile, but we are not told if the Sweet Briar tested was native or cultivated. It seems to me to produce seedlings. An abstract of Almquist's method is given, that author placing stress on glaucousness, greenness, glabrousness, and hairiness of the leaflets. their colour and consistence, their form and the direction of the teeth, while biserration, the development of glands, etc., are regarded as modifications of primary types. Whether we should adopt, as the author strongly supports, a return to the Linnean conception of species as a practical contention is somewhat open to criticism. For instance, *villosa* (*mollis*) and *mollissima* (*tomentosa*) are two physiologically distinct species, each perhaps with a somewhat parallel range of variation. Are these not conveniently kept as separate species and is there any scientific advantage in merging them? In saying this we by no means adopt the standard of Déséglise. We shall look forward with interest to further contributions from the same pen.

MAXWELL, Sir HERBERT. MEMORIES OF THE MONTHS. Sixth series, pp. xi., 314. London: E. Arnold, 1919; 7/6.

MILLSPAUGH, C. F., and SHERIFF, E. E. Revision of the [21 species of] North American species of *Xanthium*, in Field. Mus. Nat. Hist. Publ. Bot., ser. 4, pp. 9-51. 1919.

MOSS, C. E., D.Sc. THE CAMBRIDGE BRITISH FLORA. Vol. iii., Portulacaceae to Fumariaceae. Montia and Cerastium by G. C. Druce; Agrostemma, Lychnis, Viscaria and Melandryum by R. H. Compton; Fumaria by H. W. Pugsley. Cambridge University Press, 1920. pp. xvi., 200. A study of this recently-issued volume of the Cambridge British Flora deepens the sense of disappointment created by its predecessor, and strengthens the opinion that the flora is largely an artificial erection founded upon a set of over-rated drawings. After reading the introduction to this volume it is distressing to think that what might have been, botanically speaking, a great national work has been here used as a vehicle for petty personal animosity. Most botanists will agree with Dr Rendle (Nature, 11th November 1920) that "The syndics of the Cambridge University Press would have been well advised if they had exercised a fatherly censorship on several paragraphs of the introduction to the present volume." However, as nobody appears to possess the right of surveillance in the matter, and as it is unwise to allow incorrect statements issued under the sanction of the syndics of the C. U. Press to go unchallenged, some reference to them seems necessary. On p. xiv. Dr Druce is accused of "rejecting the International Rules in bulk"—a reckless charge in view of the fact that they include 58 articles and 57 recommendations covering practically the whole field of citation. Certainly, Dr Druce, on p. vii. of the Introduction to his List of British Plants ignores—on adequate grounds—the arbitrary "Nomina Conservanda" of the Vienna Congress, but only "when other generic names which appear to be properly diagnosed, have priority "—a very important qualification. In other words, instead of " rejecting the International Rules in bulk " he has taken exception only to the Nomina Conservanda—a portion of one of the 58 articles! We find again, *l.c.* p. xvi., " Druce of course introduces a novelty—he uses a capital letter when the trivial name ends in *oides*. It seems that Druce does that always because Linnaeus did it sometimes." In the use of capitals for old generic or specific names ending in *oides* Linnaeus was by no means consistent. By general consent the leading British botanists use capitals in the former case, but there are very many such instances where Linnaeus omitted to use them or used them in one work and not in another. So too with the latter, Linnaeus used capitals for them in so many instances that it would appear to have been his intention to use them generally. At any rate, it is unwise to have two methods and the use of capitals by Dr Druce certainly lessens the absurdity of such names as *Sagina saginoides*—the Pearlwort-like Pearlwort—as *Sagina Saginoides* suggests the idea that the trivial must have been established under another genus, and it is more in accordance with general custom and commonsense to retain capitals in the cases of trivials derived from proper names—*e.g.*, *Ranunculus Baudotii* or *Sagina Boydii*—than to adopt the irritating alternative. However, the matter is not one of great importance, but the tone of the Editor's reference to it leaves much to be desired, especially in view of Dr Druce's appreciative review of the earlier volume in the *Rep. B.E.C.* 1914. The Editor's bitter attack on Mr Britten, who had adversely criticised the use, in all cases, of small letters for trivial names, (p. xv.) is by general consent equally out of place in so pretentious a work as the Cambridge Flora. As a work of reference we find the present volume unequal and disappointing. In many genera the comital distribution is singularly incomplete and the maps very misleading. Maritime plants—confined to the coast—or plants growing only in one locality, afford a reason for shading an entire county, thus giving the impression that the species has a much wider distribution than is really the case. This is specially so with plants like *Arenaria rubella*, *Cerastium nigrescens* and *Arenaria norvegica*—each limited to a very small area of Unst—for which the whole of the Shetlands is shaded. It may be added that the altitudinal limits of these rare plants are inexcusably inaccurate. In Yorkshire, *Arenaria gothica* grows only near Ribblesdale, and in Sligo, *Arenaria ciliata* is confined to the summit of the Ben Bulben range, yet in each case the whole county is shaded. On the other hand, for *Dianthus deltoides*, Carnarvon, Glamorgan, Merioneth, Berks and Oxon are omitted, and for *Adonis annua*, Sussex and Hants (counties in which it is most persistent), Kent, Berks and Oxon are not indicated. *Claytonia perfoliata* is cited for 14 counties. It has also been seen in Jersey, Northants, Rutland, Beds, Middlesex, Gloster, Cheshire, York, Rothesay, Perth, Aberdeen and Inverness; so too with *Claytonia alsinoides*, for which only 13 counties are cited. It has been found in 26. Similar omissions occur for many other species—in both volumes—and one doubts whether the maps are worth the space they occupy; at any rate their deletion would reduce the high price of the book. The illustrations do not appeal to us. Although often mechanically accurate they are cold, hard, unnatural and lacking in vitality. In many cases there is little to suggest that they have been "drawn from living specimens" and on the whole they are distinctly poorer than the figures in some modern school-books and even than those in works published centuries ago. Frequently the specimens (from which the drawings have been made) have been badly selected — *cf. Stellaria media* and *Spergularia atheniensis*. The arrangement of the figures on the plates is often very crude and sometimes, indeed, they appear to have been indiscriminately thrown on the pages. In view of the high cost of material, there seems to have been no attempt to economise space by showing 3 or 4 small plants of the same genus (*e.g. Sagina*) on the same plate, and the height of absurdity is reached when a whole folio page is occupied by half-a-dozen fragments of a disrupted tuft of a single species named *S. boydi*, which Williams in his monograph reduces to a variety. Although disappointed with the drawings as a whole, one expected to find—from their very nature and accuracy—much assistance from the dissections, but here again, the writer finds them inadequate and suffering by comparison with existing work of a much less pretentious character. The standard of species chosen in the Flora differs from that of other good critical works and upon it much might be said—both for and against. The following reductions from specific rank afford material for serious thought :—*Caltha radicans*, *Ranunculus reptans*, *R. scoticus*, *R. heterophyllus*, *R. pseudofluitans*, *R. lutarius*, *Herniaria hirsuta*, *Spergula sativa*, *Sagina ciliata*, *S. Reuteri*, *S. scotica*, *Silene quinquevulnera*, *S. dubia*, *Thalictrum dunense*, and *Papaver Lecoqui*. With these we may contrast the elevation to species of *Nymphaea alba* var. *occidentalis*, *Sagina Boydii*, *Thalictrum elatum*, *Ranunculus aleae* and *R. triphyllus*. Three species are made out of the Chickweed—*Stellaria media*, *S. apetala* and *S. neglecta*—and while *Arenaria leptoclados* is reduced to a variety, the three closely allied *A. norvegica*, *A. gothica* and *A. ciliata* are kept distinct, and so too, are *A. verna* and *A. rubella*. Mr Sprague (Kew Bulletin, No. 9, 1920) has already condemned the use of *Alsine* in the sense employed in the Flora. Among the new plants described are several forms and a sub-var. of *Lychnis Flos-cuculi* and two forms of *Viscaria alpina* (Lychnis). *Thalictrum elatum* Jacq. is given as British from ? Wales, N. Riding, Durham, Cumberland and Perth. Under *Ranunculus Ficaria* a new forma *luxurians* is described and figured. and an additional full species of Buttercups is included as *R. aleae* Willkomm (if indeed, that be correctly identified). which Rouy treats as a sub-species and Burnat as a variety. The treatment of the Water Buttercups is the most disappointing portion of the Flora. Obviously on such a variable series of plants there must be divergent views, but no British botanist seems pleased with the names or limitations of species here given, and those who know the plants best agree in their disapproval of the treatment as a whole. Ten species are said to be described ; there are only nine given (22 species of Ranunculus are said to be included, 23 are described). There is no mention of the distinct *R. sphaerospermus*—by no means a rare plant. *R. heterophyllus* disappears : *pseudo-fluitans* is degraded to a form of *R. aquatilis*, a name rejected by most botanists as a *nomen confusum* ; and *penicillatus* is put as a form of *R. trichophyllus* ! We cannot for a moment concur in the suggestion that the Lynn Coron *cambricus* has any near relation to the Rescobie *subaequaneus*—the *confervoides* of Hooker (not *confervioides* as given in the Flora). nor should we put the latter under *Drouetii*. The creation of a large number of new forms—under *R. trichophyllus* there are three varieties and seven forms—adds to the general confusion To those who value a stable and uniform system of nomenclature and who realise how the constant (and often unnecessary) changing of plant-names discourages the study of systematic botany it is a matter of regret that the revival of long obsolete names (such as *R. obtusiflorus* for *R. Baudotii* and of *Cucubalus Behen* for *Silene inflata*) should be suggested. However, the latter has the advantage of yielding ten new combinations and settles—if any one follows it—the difficulty as to the trivial of the Bladder Campion. The distribution of its var. *pubescens* is by no means limited in its northward range by Cambridge. Druce has seen it in Lincoln, Baker reports it as very characteristic in Monsal Dale, Lees says it is common about Ripon, and it is mentioned in the *Flora of Perthshire*. The genus *Lychnis* is divided into four genera—*Agrostemma*, *Lychnis*, *Viscaria* and *Melandryum*—by Mr Compton, and his description of these offers many points of great interest. Dr Druce supplies an admirable revision and treatment of *Montia* and *Cerastium*, and Mr Pugsley a scholarly account of the difficult genus *Fumaria*. The work of the three botanists in question is so uniformly excellent that one is tempted to wish that the practice of employing external specialists for particular genera had been more widely followed, and especially that Mr James Groves had been induced to undertake the *Batrachia*. We share the opinion of many that the time was not propitious for the issue of so important a work in the original instance, and the subsequent abnormal increase in the cost of publication does not justify the continued production of so expensive a book—especially in view of the pressing need for a reliable British Flora in one volume at a moderate price. W. H. PEARSALL.

MURR, Dr J. FELDKIRCH. Weiteres über Urgesteinflora auf Flysch, Kriede, Lias und Trias, in Oster. Bot. Zeit. 207, 1919. La mie scoperte botaniche nel Trentino dal 1897 al 1906, con alcune aggiunte. This contains a large number of new varieties.

NORSTEDT, O. Prima loca Plantarum Suecicarum [from Franck, 1638, downwards], in Bot. Notiser, 1920.

NUTTALL, C. CLARKE. BEAUTIFUL FLOWERING SHRUBS. pp. 280, with coloured illustrations by H. Essenhigh Corke. Waverley Book Co., 1920; 40/-.

OLIVER, F. W. BLAKENEY POINT, 1917-19. This interesting summary states that on the New or Samphire Marsh the ground-level has risen a foot since 1910. At that date there were about 20 clumps of *Aster Tripolium*; to-day this area is one dense growth of *Aster* with a fringe of *Salicornia*.

OSTENFELD, C. H. A List of Arctic Caryophyllaceae, in Meddel. om Gronland 220, 1920. Thirty-eight species are mentioned. No. 3 being *Arenaria ciliata*, under which as a sub-species is *norregica* (Gunn.) Fries. It is pleasing to see that *C. nigrescens* Edmondston is the name used for the Shetland plant, but which editorial supervision prevented me from using in the *Cambridge Flora*, as Ostenfeld says *C. arcticum* Lange Fl. Dan., fasc. 50. 1880, t. 2962, is only in part the same plant and is not the *C. arcticum* Lange Consp. Fl. Groenl. 31, 1880. *Honckenya peploides* has a var. *diffusa* (Hornem.) which occurs in Scotland but is omitted from the *Cambridge Flora*. Under *Minuartia verna* Hiern has placed the Ben Lawers plant, which also occurs in Shetland as var. *rubella* (Wahl.). Vore Linde Arter, in Dansk Skovf. Tidssr. 165, 1920. Describes four species of *Tilia*, giving figures of *platyphylla* and *cordata*. A variety of the latter is *ovalifolia*. The Park Lime, *T. intermedia* Hayne = *T. europaea* L., he considers to be a hybrid of the two foregoing. Although usually barren, it has seeded (teste Prof. Somerville) in Oxford.

OSTENFELD, C. H. On *Euphorbia Esula* and its Allies, in Bot. Notiser 125, 1920. He believes the three species, *Esula*, *virgata*, and *salicifolia*, are not true natives of Scandinavia. *Salicifolia* has been found at Upsala, *Esula* and *virgata* in many places, and he gives characters which distinguish them.

PELLETT, FRANK C. AMERICAN HONEY PLANTS, together with those which are of special value to the Beekeeper as sources of Pollen: 8vo., pp. 297, tt. 155. America Bee Journal, Hamilton, Illinois: 2 dollars 50 cents.

PEMBERTON, Rev. JOSEPH H. ROSES, THEIR HISTORY, DEVELOPMENT AND CULTIVATION. Ed. 2, pp. 334. Longmans & Co.: 15/-.

PENNELL, F. W. Scrophulariaceae of the Local Flora. Contributed to New York Bot. Gard. no. 212, 1919. It gives keys to the genera and a description of the species. The names *Linaria Linaria*, *Mimulus guttatus* and *Veronica Tournefortii* are employed.

PENYCOSTE, Dr F. H., and Miss. Cornish Phenology, in Science Progress, July 1920.

PROBST, R. Die Adventiv-und Ruderalflora von Solothurn und Umgebung, in Mitt. der Naturf. Gesell. Solothurn. 5 Heft, xvii., Bericht, 1911-14. Reprint. This contains a list of 511 species and many sub-species of alien plants derived not only from wool but to a large extent of garden origin. A second Beitrag appeared in the same publication in Heft xviii., 1914-19. This contains a figure of *Thellungia advena* O. Stapf. supposed to be of Australian origin, also *Chenopodium auricomiforme* Murr & Thell.

PUGSLEY, H. W. Notes on British Hawkweeds, in Journal of Botany 281, 1920. *Plantago alpina* and *P. maritima*, *l.c.*, 149.

REDGROVE, H. STANLEY. BYGONE BELIEFS, being a series of excursions into the Byways of Thought. pp. xvi., 205. tt. 32. W. Rider & Son, London, 1920; 10/6.

RIDDELSDELL, Rev. H. J. British Rubi, 1900-20, in Journal of Botany 101, 1920. An attempt to summarise the changes in our ideas about British Rubi since the publication of Rogers' Handbook. Some of these have been forestalled in the *British Plant List*. The works of Focke and Sudre receive little or no attention. Those will doubtless be given later. Plant and Rose Records, *l.c.* 113, 114.

RIDLEY, H. N. *Plantago Cynops* in Kent, in Journal of Botany 271, 1920. See also page 35.

RIVETT, MAUD F. The Anatomy of *Rhododendron ponticum* and of *Ilex Aquifolium* in reference to Specific Conductivity, in Ann. Bot. xxxiv., pp. 525-550, 1920.

ROLFE, R. Orchid Review, 1920. This includes a reference to

Colonel Godfery's paper read at the British Association Meeting in Bournemouth. The statement that *O. ericetorum* was first separated from *O. maculata* by E. F. Linton is not quite correct. Webster first named a var. (or, as he thought, a good species) from *maculata* under the name *praecox*. It is also a little uncertain whether the marsh orchid which crossed with the frog orchid on the Wiltshire downs was *latifolia*. On p. 113 there is a good figure of a group of "*O. latifolia* × *maculata*," which is probably *O. praetermissa* × *maculata*. Mr Rolfe says "it is widely diffused, fertile, and subject to reversion." *O. elata* Poir., a *latifolia* hybrid, seeds freely at Glasnevin. The original plant was said to be abundant on the plains of Mazoule, Maison Carrie, and marshes of Harratch.

RYDBERG, PAUL. Notes on Rosaceae. in Bull. Torr. Club 45, 1920.

SALISBURY, Dr E. J. A Draft Scheme for the Representation of British Vegetation in Black and White. in Journal of Ecology 1, 1920. Forty-five symbols, suggestive of the dominant species, are sketched, which seem well chosen for the purpose, now rendered necessary by the increased cost of colour-printing. It may be suggested that it would be more correct to use "Juncetum subnodulosi" rather than "obtusiflori" and "Nymphaeetum" instead of "Nupharetum," since the latter is freer from objection. The question arises, too, with "Glycerietum," which some botanists would call "Puccianelletum" and others "Atropisetum," if *Glyceria* is split into two genera.

SALISBURY, F. F., M.A. Naturalised Plants of Albany and Bathurst, S. Africa, in Rec. of Albany Museum, vol. iii., 1919. The poisonous property of *Lolium temulentum* is said to be due to a parasitic fungus in the grain.

SALISBURY, F. S. SOME HAUNTS OF WORCESTER FLOWERS. pp. 82, tt. 40. Worcester, J. S. Phillips, 1920; 1/6. Useful and practical.

SARGEAUNT, JOHN. THE TREES, SHRUBS, AND PLANTS OF VIRGIL. The poetry of Virgil, in his Bucolics and Georgics, breathes all the fresh air of the country near Mantua where he was born, or of the Sicily of his model Theocritus. We smell his fruits and flowers; we hear the cigala in the bushes; we watch the goats that seem to hang from the rock while they are browsing. We are in Sicily or in Arcadia or wandering in Northern Italy, and in reading we feel how much the images which he presents to us gain if we can visualise the trees and plants which surround his characters and which he tells of so often and sometimes describes. To that enjoyment this little book contributes by its identification of most of Virgil's plants, and it would be well if it were in the hands of all who study or who comment on the poems of the great Roman writer. Indeed the want of such knowledge has led to some very curious information, as when Professor Conington explained that *Viburnum Tinus* is "a kind of wild bay tree." In too many cases, unfortunately, the names in Theocritus and in Virgil remain a puzzle. It is difficult, for example, to discover any plant which will agree with the statements of Theocritus, Virgil, Ovid, Columella and others, as to what they called "hyacinth." The author's suggestion of *Gladiolus segetum* may be the best, but would any one imagine a bull supporting his sides on "soft" gladiolus and that under an Ilex, or the Corycian at Tarento cutting the flowers of gladiolus while the frost was splitting the rocks and "curbing" the rivers? In this last passage indeed some MSS. have "acanthi" for "hyacinthi" and our author seems to adopt this reading on p. 10. In the article on Malus the author says it is difficult to make anything of "mala" in Ecl. ii., 51, on account of the description of the fruit, "gray with soft down," not being applicable to quinces. It is conceivable that he has missed the fragment in which Petronius frankly plagiarises this passage and substitutes "Cydonia" for "mala," describing them as "velleribus hirsuta canis." Now Petronius, as a bon vivant of pronounced character, must have known what his quinces were like. Another puzzle is Virgil's use of colour words. On p. 4 our author seems a little bitten with Mr Gladstone's idea that the colour sense was imperfect with "the ancients." Yet if we reflect on the perfection of this sense in much lower animals (as shown by the minuteness of protective colouration and of the methods whereby flowers attract their fertilising insects) we can scarcely believe that so far more developed a being as man could be inferior to them only 2000 or 3000 years ago. Even to palaeolithic man as to savages an acute colour sense could not fail to be of use in detecting prey and in avoiding enemies. It is easier to suppose that poetic phraseology and (alas!) the claims of metre were responsible for Virgil's vagueness of colour description. The book is not without its humorous side in spite of its learning. The flavouring which Thestylis (Ecl. ii. 10) concocts for the reapers (beaten up thyme and garlic). and which was mixed, it seems, with flour and cheese and oil and vinegar—

"herbs and other country messes"

as Milton puts it—certainly reminds us of the elaborate recipe to which some wit appended the advice:—"and then throw the whole beastly mess out of the window!" The book is a very admirable addition to our resources for the study of the classical names for plants. F. BENNETT.

SCHROETER, C. In the Jahrsb. Schweiz. Alpenclub 170, 1918. our hon. member gives an account of the Swiss National Park in the Lower Engadine and a description of the dominant plant associations of the area, which is fully described in Le Parc Nationale. par S. Brunies (Beuno Schwabe et Cie, Bale, 1920; 12 francs).

SEWARD. Prof. A. C. FOSSIL PLANTS. A text book for students of Botany and Geology. Vol. iv. Gingkoales. Coniferales, Gnetales. tt. 190, pp. xv., 544. Cambridge University Press: 21/-.

SHOOLBRED, W. A., M.R.C.S., F.L.S. THE FLORA OF CHEPSTOW. pp. vii., 140, and map. London: Taylor & Francis: 10/6 net. Our member is to be congratulated in producing in times even worse than those of war this handy volume. It treats of a very beautiful district, which has even a modicum of maritime plants and spreads upwards to the wooded heights of the Wynd Cliff and to an altitude in Chepstow Park of 900 feet. Its greatest length and breadth seem to be 9 and 12 miles. The geological strata and the surface soils are very variable, so that a rich flora is to be expected. It has one plant practically confined to it in Britain, namely. *Euphorbia stricta*. Other rarieties are *Hutchinsia*, *Pyrus cordata* (if that be the correct name), *Sedum rupestre*, *Pyrola secunda*, *Salvia pratensis*, *Polygona-*

tum odoratum, *Lilium Martagon*, *Carex digitata*, *C. montana*, *Rumex crispus*, var. *planifolius*, *Viola rupestris*, and *Campanula patula*. Mr Shoolbred has included 1013 species of flowering plants and ferns and 179 mosses. It may be necessary to say that this number includes natives and adventive species. *Polygonum cuspidatum*, which is naturalised on the Wye, and *Populus deltoidea*, which occurs in both counties, may be added. We notice that while *Helleborine* and *Centaurium* are rightly adopted, *Nasturtium* is retained instead of *Radicula*. We prefer to put the var. *oedocarpa* And. under *Carex flava* rather than under *C. Oederi*, which seems a distinct species, nor is there need to say *C. curta* Good., *C. canescens* auct., non Linn., which is reversing the fact. It is *C. canescens* Linn., but not of all authors. So, too, with *C. muricata*, which is L. Sp. Pl. in an aggregate and perhaps even in a restricted sense. In many instances the plants of Linnaeus' Herbarium do not agree with the *Species Plantarum*, but time need not be wasted in reiterating them. Space is saved by omitting the earliest notice of plant occurrence. To any visitor who wishes to explore this fascinating country the flora may most cordially be recommended.

Sipkes, C. Dutch Orchidaceae, in Nederland Kringkundig Arch. 145-154, 1919. Includes eight new varieties of *Orchis morio*, one of *Habenaria Gymnadenia*, and two of *Habenaria viridescens*. The author tells me he has found *O. praetermissa* in Holland, near Aalsmeer, Castricum Groede, and Heille on the Belgian Frontier. He at first thought it a good species allied to *incarnata* and not a hybrid.

Smith, H. Vegetationen och dess utrecklingshistoria i det central-svenska hogfjallsomradet Nordland. Hanndbibl. ix., pp. 238, Upsala, 1920. This inaugural dissertation is remarkable from the large number of hybrids given which have been found in Harjedalen and Jamtland. Among them are some which might occur in Britain :—*Woodsia alpina* × *ilvensis*, *Carex atrata* × *Halleri*, *Luzula arcuata* × *spicata*, *Draba incana* × *rupestris*, and *Poa alpina* × *pratensis*. This last is named *P. herjedalica*.

Sprague, T. A. *Stellaria* or *Alsine*, in Kew Bulletin 308, 1920. An extremely valuable paper, giving the most complete history yet published of the genus or genera. He holds, in contradiction to the views of many American authorities, that the name *Stellaria* should be used and should include *Alsine media* L., notwithstanding that *Alsine* has priority of place in the *Species Plantarum*, giving a reason not previously urged—that Linnaeus, in order to conform to his Artificial System, dissociated *Alsine*, a Tournefortian genus, from *Stellaria*, which he established in 1735. He suggests that "priority of place" for genera should be reconsidered, since in *Sp. Pl.* "the generic name in Pentandria simply meant that it came before one in Decandria." He agrees with splitting the genus *Arenaria*, the second genus being *Minuartia*, and disagrees with Moss, who wishes to retain *Alsine*, a name which, as Sprague shows, is untenable since it involves ruling out the first edition of the *Species Plantarum*, which is contrary to International Rules. Neither can *Alsine* be used, as advocated by Hiern, to represent *Spergularia* (a conserved name), since *Alsine* L. = *Stellaria* L., and he gives six reasons for using the latter name. Moreover, Cyrillo was the first to unite the two genera under the latter name, which is allowed by the International Rules. Therefore, the name *Alsine* L., which is badly defined in *Gen. Pl.* and which as a type species is aberrant, disappears, *Spergularia* being at present a conserved name, representing *Alsine* L. emend Reich. 1832, *Buda* and *Tissa* Adanson. The last of these has strict priority. Fernald (*Rhodora* 1, 1919) however (and in this I should agree) uses *Arenaria* L. so as to include *Minuartia*. The multiplication of these small and often ill-defined genera is to be deprecated, especially when it involves the change of well-known names.

STAPF, Dr OTTO. GRAMINEAE—FLORA OF TROPICAL AFRICA. Vol. ix., pt. iv., pp. 577-760, 1920. Of the 178 genera, *Setaria*, which is 75, completes the part.

STEPHENSON, T. & T. A. A New Marsh Orchis, in Journ. Bot. 164, 1920. *i.e. Orchis purpurella*. The British Marsh Orchids in relation to Mendelian Principles in Journ. Bot. 243, 1920. The Genus Epipactis in Britain *l.c.* 209-213, with figures of the labellum. The British Palmate Orchids *l.c.* 258-262. In this paper *praetermissa* and *purpurella* are kept as distinct species.

STONE, HERBERT. A GUIDE TO THE IDENTIFICATION OF OUR MOST

USEFUL TIMBERS, being a Manual for the Use of Students of Forestry. Cambridge University Press, pp. 52, 1920 : 7/6. Descriptions of the transverse, radial and tangential sections are given, and paragraphs are devoted to the various trees with which, for instance, Ash may be confused and how it may be distinguished from them. Keys to the broad-leaved and coniferous trees are given, and there are twelve good figures of sections of woods. One hopes that another volume will include the other timbers used in Britain.

STORK, HARVEY E. Studies in the Genus *Taraxacum*, in Bull. Torr. Club 199, 1920. *Taraxacum* exhibits parthenogenesis as established by Raunkier's classic experiment, but his suggestion that this occurred in all forms of the genus was disputed by Dahlstedt, and Rosenberg showed that *T. confertum* was normally sexual. Mr Stork made cultures and found that *erythrospermum* reproduced itself with only a change in size, and that out of eight sets of *vulgare* seven came true and could not be distinguished from each other.

SUDRE, H. RUBI EUROPEA. This monumental work on the Brambles has been already mentioned in the *Report*. The major species number 110. Only one, *R. orthocladus* Ley, of those described by British authors in recent years is included in this number, all those of Moyle Rogers and Babington being placed in a subordinate position. Doubtless the views of Sudre will not receive unqualified assent by British workers but the work is one of great importance and this volume, with its beautiful plates, will have to be carefully studied by all workers on the genus. The following are the more important changes in nomenclature which are made and also the new plants he includes for Britain.

754. RUBUS NITIDUS W. & N., var. HAMULOSUS (L. & M.) Sudre Rubi Eur. 19. Brit. Rubi n. 3. Var. ANGLICANUS Sudre, *l.c.* = 755. *R. opacus* Rogers Handb. 23, p.p., not of Focke. Somerset (? etc.).

755. R. OPACUS Focke, var. GLANDULIFER Sudre, *l.c.* 19 as a var. of the subspecies. Graffham, Sussex, LINTON.

757. R. INTEGRIBASIS P. J. M. (not of Rogers), var. GENUINUS Sudre, *l.c.* 20. Britannia. Var. SUBOPACUS Sudre in Bouv. Rub. Anjou 7, 1907 = 755. *opacus*, f. *minor* Rogers Handb. 23. Brit. Rubi n. 106. S. Devon.

761. R. IMBRICATUS Hort, var. DISCOLOR Sudre. Britain. Var. RECTISPINUS Sudre = 758. *R. cariensis* Rogers, not of Génév. N. Devon. See p. 67.

763. R. CARPINIFOLIUS Weihe, var. LAXUS Sudre, *l.c.* 23. Mitcheldean, Gloster. Var. LENTIGINOSUS (Lees) Sudre. Carnarvon, etc. M. Sudre says British authors have confounded distinct plants under this name.

766 (3). R. OPLOTHYRSUS Sudre. Branksome Park, Dorset, ROGERS as *dumnoniensis*. Sudre Rubi Eur. 60.

766. R. CRYPTADENES Sudre Obs. 31, 1904 = *R. erythrinus* Rogers, non Genev. Brit. Rubi n. 108. Var. STEREACANTHOIDES Sudre Bat. 81, 1908. Marsdur, Yorks, BAKER. Var. BIPARTITUS Sudre, *l.c.* Surrex [? Surrey or Sussex], MURRAY. This is subordinate to *argenteus*, which has a var. CLIVICIOLUS Sudre Rubi Eur. 57. Woolard, N. Somerset, FRY.

770. R. OXYANCHUS Sudre Obs. 18, 1904 = *R. nemoralis* Rogers, not of P. J. M. with var. SILURUM (Ley). Subordinate to this is R. VIRIDICATUS Sudre Obs., *l.c.* = *R. nemoralis* Rogers, p.p. Brit. Rubi n. 56, in part. Iford Bridge, S. Hants, LINTON. See p. 38.

773. R. POLYANTHEMUS Lindbg. in Bot. Not. 105, 1883, vice *R. pulcherrimus* Neuman, not of Hooker.

773. R. HEREFORDENSIS Sudre Obs. 33, 1904 = *R. pubescens* Rogers, p.p. Caplar, Hereford, Ley [? Capley]. Sudre Rubi Eur. 64. Brit. Rubi n. 115. R. HEREFORDENSIS × VESTITUS = *R. leucostachys*, var. *gymnostachys* Rogers. Brit. Rubi n. 14. Kerne Bridge, Hereford, ROGERS.

776. R. OBVALLATUS Boul. & Gillot, var. BAGNALLII Sudre, *l.c.* 66 = *R. bracteatus* Bagnall. Brit. Rubi n. 110. Berks, etc.

777. R. VILLICAULIS Koehl., var. ATRICAULIS N. Boul. Yorks. Here also is R. INSULARIS Aresch. Brit. Rubi 77, 111 = *R. villicaulis* Rogers, p.p.

780. R. SAMPAIANUS Sudre, *l.c.* 43. Rubi Eur. 259. Witley, Surrey, LINTON.

783. R. CLETHROPHILUS Genev. Ess. 257, 1869 (R. RAMOSUS Briggs), var. PUBESCENS Sudre, *l.c.* = 787. *R. pubescens*, var. *subinermis* Rogers, not *R. subinermis* Rupr. Brit. Rubi n. 81.

784. R. THYRSOIDEUS Wimm. Under this is R. CANDICANS

Weihe which, with var. COARCTATUS Sudre Bat. 24, 1904, occurs in Britain but not type *thyrsoideus*. See p. 92.

785 (2). R. WINTERI P. J. Muell. Focke Syn. 196, 1877 = *R. argentatus*, var. *robustus* Rogers Handb. 39.

785 (3). R. PROPINQUUS P. J. Muell. Vers. n. 20. 1859 = *R. argentatus* Rogers Handb. 39, non P. J. M. Brit. Rubi n. 30.

791 (2). R. SCHLECHTENDALII W., var. ANGLICUS Sudre. *R. Schlechtendalii* Rogers. Brit. Rubi 84. Mortimer Common, Berks. Here comes R. HIRSUTISSIMUS Sudre & Ley. W. Newton, Hereford, LEY.

794. R. COLEMANNI Bloxam, var. DECLINIS Sudre. Brit. Rubi n. 12. Hambledon Common, Surrey, MURRAY. Var. FEROCISSIMUS Sudre Rubi Eur. 116. Lafkion Hill (*?*). Cheshire, WOLLEY-DOD.

796. R. ORTHOCLADOS Ley × GRATUS Focke = *R. dobuniensis* S. & Ley. Gloucester, LEY. Sudre, *l.c.* 31.

800. R. PYRAMIDALIS Kalt. × PROPINQUUS Sudre = 799. *R. iricus* Rogers. Under 800 Sudre puts 772. *R. dumnoniensis* with new vars. :—var. EUPECTUS Sudre. Cowleigh, Hereford, LEY, and var. TRANSIENS *Sudre*. Dorset. Brit. Rubi n. 86. Here, too, are put R. AMPLIFICATUS Lees and R. MELANOCLADUS Sudre (the 798. *hirtifolius* of Rogers, not of P. J. M.).

800. R. PYRAMIDALIS × CAESIUS. Dorset, E. F. LINTON, under the name *Balfourianus*. This latter plant is also thought to be a hybrid. Babington and other botanists have included very different plants under this name. See p. 237.

804. R. LASIOCLADOS Focke. Sudre Rubi Eur. 103, identifies this as *R. vestitus leucanthemus* × *Winteri*. M. Sudre, I think on insufficient grounds, replaces *R. leucostachys* Sm. by *vestitus* which dates from a year later. Under it he has subordinate species R. LEUCOTRICHUS Sudre Bat. 55, 1906, var. SUBEGLANDULOSUS Sudre, from Edmondsham, Dorset, LINTON, also a hybrid LEUCOTRICHUS × PYRAMIDALIS = *R. cornariensis* Sudre. Pensylvania, Cheshire, WOLLEY-DOD.

807 (2). R. MACROSTACHYS P. J. M. in Flora 150, 1858, var. SEPINCOLUS Sudre Rubi Eur. 105. Caplar, Hereford, LEY. [? Capley]. Here also comes R. WOLLEY-DODII Sudre, *l.c.* 106 = *R. criniger* (Linton) Rogers Handb. 52, p. min. part. Edge Park, Cheshire, WOLLEY-DOD.

810. R. MUCRONATIFORMIS Sudre Bat. 39, 1905 = *R. mucronatus*, var. *nudicaulis* Rogers (Brit. Rubi n. 88). As a sub-sp. of *R. hypomalacus* Focke. See p. 30.

816. R. OBTRUNCATUS P. J. M. in Flora 152, 1858, var. ANGUSTICUSPIS Sudre Obs. 35, 1904 as sp. = *R. setulosus* Rogers Brit. Rubi n. 121, not of M. et Lefv. Oxford, etc.

835. R. FUSCUS Weihe, var. ADAMSII Sudre Rubi Eur. 142. Brit. Rubi n. 94, p.p. Crowell Hill, Oxfordshire. Rev. D. O. ADAMS. It is, in part, the *R. Babingtonii*, var. *phyllothyrsus* Rogers.

843 (2). R. ERRATICUS Sudre, in Bull. Bot. Soc. Fr. 91, 1899. Herefordshire, LEY.

844 (2). R. LOEHRI Wirtg. Brit. Rubi n. 18. Sudre, *l.c.* 154.

850. R. ROSACEUS Weihe, var. SCABRIPES Genev. Brit. Rubi n. 21. Chard, Somerset, MURRAY.

857 (2). R. SPINULIFER M. et Lefv. = *R. Koehleri* Rogers, p.p. Brit. Rubi n. 127. Walford, Hereford, LEY.

860. R. MARSHALLI Focke & Rogers. This, Sudre states, is a hybrid of *Babingtonii* and *fusco-ater*. The var. *semiglaber* has a differ nt origin.

865. R. ANGUSTIFRONS Sudre Ronc. bret. 21, 1904 = *R. serpens* Rogers, p.p., not of Weihe. Brit. Rubi n. 74. Var. PALLIDISETUS Sudre. Gloucester, LEY & ROGERS. Brit. Rubi n. 47.

866 (2). R. SCHLEICHERI Weihe. Yorkshire. Sudre Rubi Eur. 199.

866 (3). R. RIVULARIS P. J. M. & Wirtg., var. HIRTIFORMIS Sudre = *R. hirtus*, var. *rotundifolius* Rogers Brit. Rubi n. 102. Chard Common, Somerset.

866 (4). R. NAPOPHILOIDES Sudre. Bull. Bot. Soc. Fr. 25. 1804 = *R. flaccidifolius* Rogers, not of P. J. M. Woburn Sands. Brit. Rubi n. 129.

868. R. ROTUNDELLUS Sudre. Bull. Bot. Soc. Fr. 23, 1904. St Leonards Forest, Sussex. p. 188, under *Koehleri*.

870. R. HYSTRIX Weihe, var. MURRAYI Sudre 181. This is the 852. *adornatus* of Rogers Handb. 80, not of Muell. Brit. Rubi 71.

876. R. POLYANTHEMOS × CAESIUS = *R. Warrenii* Sudre is

said, Rubi. Eur. 240, to be *R. dumetorum*, var. *concinnatus* Warren.

876. R. ALTERNIFLORUS, var. HEREFORDENSIS L. & W. × CAESIUS = *R. semialterniflorus* Sudre, *l.c.* 240. The *sublustris*, Brit. Rubi n. 106, Sudre says is *R. alterniflorus*, var. *herefordensis* × *caesius*.

876. R. PROPINQUUS × CAESIUS. Buckden, Hunts, W. R. LINTON, teste Sudre, *l.c.* 242.

876. R. ADSCITUS × CAESIUS = p. 246. *R. corylifolius*, var. *fasciculatus* Rogers, p.p. Curdworth, Warwick, BAGNALL. Brit. Rubi 50.

876. R. ECHINATOIDES × CAESIUS = *R. dumetorum*, var. *diversifolius* Rogers. Sudre Rubi Eur. 248. Cheshire, WOLLEY-DOD: Somerset.

876. R. RUFESCENS, var. DASYPHYLLUS × CAESIUS = *R. dasyphylloides* = 251. *R. dumetorum*, var. *ferox* Rogers, non W. & N. Bournemouth, S. Hants; Shirley, Derby. Brit. Rubi 131.

876. R. APICULATUS × CAESIUS = *R. semiapiculatus* Sudre, *l.c.* 248. Herefordshire, LEY.

876. R. LONGISEPALUS × CAESIUS = *R. Pseudopsis* Gremli = *R. dumetorum*, var. *britannicus* Rogers Handb. 93. Surrey. Brit. Rubi 105.

SULMAN, Miss FLORENCE. A POPULAR GUIDE TO THE FLOWERS OF NEW SOUTH WALES. Vol. ii., pp. xxxi., 249, tt. 71. Angus & Robertson, Sydney; 6/-.

THELLUNG, Dr ALBERT. Zur Gliederung von *Hordeum murinum* L., in Allg. Bot. Zeitschr. xxiv., 6, 1920, includes a var. *intercedens* Thell. and a sub-sp. *leporinum* A. & G., with three new forms.

TOPPIN, Major S. M., R.A.M.C. Notes on the Balsams of Chitral and the Kachin Hills, in Kew Bulletin 345, 1920. Includes details of the flower of *I. Roylei* Walp. and other species, about 50 being described.

VOIGT, ALBAN. Beitrage zur Floristik des Tessins, in Berict Schweiz. Bot. Gesell. 33, 1920. In this valuable paper our member gives the results of his researches in this beautiful district, to which he has made many important additions. These include many adventive species, among them the West Floridan Indian climber *Apios tuberosa* and the ubiquitous *Matricaria suaveolens.* 114 species are additional to the Canton and 16 are new to the Swiss Flora. Among the plants found are *Juncus obtusiflorus*, *Aconitum Anthora*, *Clematis alpina*, *Cuscuta Cesatiana*, *Artemisia Selengensis* (a Siberian species which threatens to be a perfect pest at Lugano and Maggiore), *Cyperus Michelianus* and *glomeratus* near Chiasso.

WADE, A. E. NARBOROUGH BOG AND AYLESTONE MEADOWS: an Ecological Study from an Original Survey. A memoir of the Leicestershire and Rutland Flora, 1919. This is a very useful account of the area and of the plant associations it contains.

WATSON BOTANICAL EXCHANGE CLUB, 1918-20. Secretary, G. Goode; Distributor, J. E. Little. Vol. 3, pt. 3, pp. 87-130. Memoir and excellent portrait of Rev. E. S. Marshall.

WEBSTER, ANGUS D. LONDON TREES. pp. 218. tt. 32. Swarthmore Press, 1920; 15/-. *Ailanthus glandulosa*, *Catalpa bignonioides*, *Platanus*, *Pyrus Aria*, all do well even in smoky atmosphere. Even *Paulownia imperialis* attains a considerable size.

WHELDON, J. A. Llanberris Lichens, in Journal of Botany 11, 1920. It contains a new species, *Bilimbia cambrica*, from Snowdon, at 3000 feet. Another unexpected species found on Snowdon was *Cerania vermicularis*, which Mr Wheldon showed us *in situ*.

WHITE, F. A. The Flora of the Somme Battlefields, in Gard. Chron. ii., 276, 1920. *Brassica arvensis* is the most characteristic species, but the Poppies and the Scarlet Pimpernel are all common. Nettles are 6 feet high at Serre.

WOLLEY-DOD, Lt.-Col. A. H. A Revised Arrangement of British Roses, in Journal of Botany Supplement, 1920.

YOUNG, W. Preliminary Notes on the Flora of Fife and Kinross, in Trans. Bot. Soc. Edin. p. viii., 1920. It is to be hoped that the completed work may find a publisher.

OBITUARIES.

BAKER, JOHN GILBERT. Botanists have a proverbial longevity, and a striking example is afforded by one of the greatest of British systematists who died on August 16th of this year at Kew, full of honours, in the 87th year of his age, he being born at Guisborough on January 13th, 1834. Taxonomic Botany has lost one of its most industrious exponents and the botanical world one of the kindest-hearted and most simple-minded of men. This Club and Society loses a remarkable link with the past. To him it practically owes its existence. He was the guardian of its early years, its acute observer, its industrious investigator and valued referee for several decades. His early biography is so identified with us that to attempt to delineate it is to write our history. To our more recent members, many of whom have grown up since his active years, it may be well to recall the fact that our Society was first founded as the Botanical Society of London on July 27th, 1836, at a meeting convened by Mr Daniel A. Cooper at the Crown and Anchor Tavern, Strand. The objects were the advancement of Botanical Science in general, but more especially Descriptive and Systematic Botany, by the reading of original papers on the habitats, particular characters, etc., of plants, and by the formation of a Library, Museum, and Herbarium for reference and exchange of specimens. The name first suggested was the Practical Botanists' Society of London. The subscription was fixed at a guinea. Ladies were eligible as members. The Council was formed of six members, with a Treasurer and Honorary Secretary, its first paid Curator being Daniel Cooper, the author of *Flora Metropolitana*. The first meeting was on October 12th and the second meeting was held on Thursday, November 3rd, 1836, Dr J. E. Gray, keeper of the Zoological Department of the British Museum, occupying the chair. It was then decided to take rooms for the Library, Museum, and meetings at 11 John Street, Adelphi, and November 29th, the anniversary of John Ray's birth, was fixed for the anniversary meeting. It may be added that the first Secretary was W. M. Chatterley, and its President was Dr J. E. Gray, who, although his father's name (S. F. Gray) is on the title page, had the greater part in the preparation of the *Natural Arrangement of*

Plants, issued in 2 volumes in 1821. The members of Council included G. E. Dennes, C. E. Sowerby, Dr M'Intyre, and Dr Bell Salter. At the December meeting Dr M'Intyre read a paper on the Flora of Warley Common, Essex, which enumerated 23 Filices, 136 Monocotyledons, and 522 Dicotyledons, exclusive of Salices. On January 5, 1837, Daniel Cooper read a paper on the Flora of Battersea Fields, in which he stated that 406 species (the specific standard being that of Lindley's Synopsis) had been found on a piece of ground 1½ miles long and 1 mile broad. The report read at the anniversary meeting states that "4819 specimens of British plants had been received; 1313 of these had been arranged in the Herbarium. The duplicates will be distributed by the Curator . . . among the members . . . in proportion to their contributions." A large herbarium of French plants, supposed to have belonged to Jean Jacques Rousseau, was presented by the Secretary. A number of North American plants, collected by the officers of the Hudson Bay Company, was given by Joseph Freeman. Three new British plants were sent:—*Claytonia alsinoides*, by Mr W. Baxter of Oxford; *Spartina alterniflora* from Itchen Ferry, by the Vice-President, Dr Macreight: and *Cinclidium stygium*, from Mr Leyland of Halifax. Drawings of *Victoria regia* and *Loranthus Smythii* were presented by R. H. Schomburgk from British Guiana. At the subsequent monthly meetings good papers were read and interesting exhibits shown. At the anniversary meeting on November 29, 1838, the membership-roll had increased to 100, of whom 24 were foreign and 34 corresponding members. The receipts were £71 16s 6d, the expenses £66 16s 10d; 18,592 plants had been received, including a valuable set of Willows from Mr Baxter, as well as 10,000 foreign specimens, H. B. Fielding being the chief donor. At the meeting on November 15, 1840, the Rev. A. Bloxam showed a small, slender-stemmed and purple-flowered *Euphrasia* from Seamor Moor, Scarborough, which was doubtless *E. gracilis* Fries. At the annual meeting, November 29, 1841, 24,860 British and 6000 foreign specimens were announced as having been sent in. Rev. A. Bloxam exhibited *Myriophyllum alterniflorum* (which he first made clearly known), gathered at Twycross in 1839. On November 29, 1842, the Society had grown to 152 members. H. C. Watson presented 5500 British plants. On November 29, 1844, there were 173 members. G. E. Dennes was Secretary and J. E. Gray still President. In this year the first edition of the *London Catalogue* was compiled by Mr H. C. Watson. At the annual meeting in 1849 the Society numbered 219, and in 1850, 255 members. Mr H. C. Watson was requested to compile a third edition of the *London Catalogue*, which had its origin in the Society and which gave to it its name. These were the palmy days of the Society, which had very excellent meetings, some interesting excursions, and a good Exchange Club; but the expenses of the rooms for the valuable Library and Herbarium in London and of a paid Curator were too great for the receipts, and gradually the Society fell into monetary troubles, so that in 1858 the books and plants had to be disposed of and the rooms closed and the Society as such terminated. Its career had been useful and indeed brilliant. Its minutes contain much of interest and value. Some day, if time and money could be found, one would like to give a precis of them as a Supplement to this *Report*. The Thirsk Natural History Society had been founded in 1853, and one of its most active members was John Gilbert Baker, who was then engaged in a drapery business in that pleasant Yorkshire town. He had as an intimate friend, Mr W. Foggitt, a chemist of the same place. They were both intensely interested in Botany, and both have relatives in our Society of to-day. To Baker's zeal the Thirsk Society owed its success. The members started a Botanical Exchange Club in 1858 in connection with it, Baker having got into touch with many members of the Botanical Society of London and induced them to join and thus to carry on the traditions as well as one of the main features of the old Society. The Club met monthly at Thirsk under the Presidency of J. G. Baker. The reports of the meetings appeared from time to time in the *Phytologist* until that excellent botanical publication succumbed. In 1862 there appeared as a separate publication the first *Report of the Botanical Exchange Club of the Thirsk Natural History Society*, which is given *in extenso* in Seeman's *Journal of Botany* p. 142, 1863. An abstract of the 1864 *Report* appears on p. 252 of the same Journal in 1864. In 1865 J. G. Baker and W. Foggitt acted as Curators. It then consisted of 50 members. In that year the Thirsk Natural History Society was dissolved, but the Exchange Club connected with it was removed to London, and the *Report* for 1866 appeared under the new name of the London Botanical Exchange Club, with J. G. Baker and H. Trimen as Curators. This change was brought about by a disastrous fire on May 14, 1866, which destroyed Baker's shop and dwelling-house, his library and specimens. The damage amounted to £10,000, scarcely a tenth of which was insured. By that date Baker's botanical work was known to be of a high order of merit, and his fellow-botanists and friends presented him with a handsome sum to replace his library; indeed, as he says, "it is far more than sufficient to replace all my botanical belongings which money can restore." The Secretary for the subscription list was J. T. Boswell Syme, and W. Carruthers, Rev. W. W. Newbould, Edward Newman, and H. C. Watson acted as the Committee. It may be added that Mr Baker's brother lived in the adjoining house, which was also burned, and that both families barely escaped with their lives. The destruction of his premises and the great monetary loss which it involved led him to ponder over his future career. Financial success was more likely to be achieved in business. Botany, unless professorial, offered small encouragement, but his scientific ardour was well developed and he took the wiser course, and in January 1866 was appointed first assistant in the Kew Herbarium. This explains the removal of our Club and its change of name. The *Report* for 1867 by the same Curators contains a description of a new Rose, *R. Hailstoni*, by Baker. In 1868 Boswell Syme was its Curator, Baker and Trimen acting as Secretaries. In 1869 Trimen withdrew on his appointment to an assistantship at the British Museum, and in that year Seeman's *Journal of Botany* bore on its title page the names of Baker and Trimen as assistant editors. To this Journal for many years Baker contributed most valuable articles. In 1869 he published in the Linnean Society's *Journal* a Monograph of the British Roses, arranged under 13 species. It was a very useful work, and its main divisions were adopted by British botanists for many years. It included about 20 varieties to which his name as author was attached. The *Report* for that year was edited by Boswell Syme, the word "London" dropping from our title. In 1872 Seeman's connection with the *Journal of Botany* ended and H. Trimen became its editor, assisted by J. G. Baker. This lasted till 1876, when Baker's name disappeared from the title page. The subsequent history of the Club need not be further alluded to except to say that in 1879 great difficulties were encountered in distributing the specimens, a task which had been most carefully performed by T. Archer Briggs from 1875 to 1877. Baker edited the *Report* for 1878, the *Report* for that year announcing that Mr Charles Bailey had kindly undertaken the general management of a new Exchange Club, a task he most efficiently performed until 1892, when it came under the present regime. It may be added that the largest membership roll of the London Botanical Society was 255; that of the Botanical Exchange Club (including the Thirsk) was 65. From 1858 for very many years Mr Baker was one of our most valued members, and on the death of Sir Joseph Hooker in December he was made its only British Honorary Member. It is necessary now to go back to Baker's early history as apart from our Club. He was born at Guisborough on January 13, 1834, coming from a family of hardy Yorkshire dalesmen who had their home in Danby dale. His schooling was obtained at the Friends' Schools at Ackworth and Bootham, where natural history was wisely a portion of the curriculum. This stimulated him to study the plants of the vicinity when he was only 12 years of age. Baker published his first work on "The Flowering Plants and Ferns of Great Britain" when he was 21, but the previous year he had a note on *Carex Persoonii* in Yorkshire (*Phytologist* 738), which he found in Snaiлesworth in a rather boggy wood near the source of the Locker Beck. It may be well to add that it is a form of *C. canescens*, not the true *Persoonii*. He and his friend William Foggitt must have tramped over a large part of the neighbouring country. It is, of course, with Baker's study of British plants that we are most interested. Therefore a short reference must be made to his important contributions to British Field Botany. In 1854, in conjunction with John Nowell he issued a Supplement to the *Flora of Yorkshire*. This was still further treated of in his *North Yorkshire*, published in 1863. This important work was not only a Flora but an excellent digest of the county's Lithology, Geology, Topography and Physical Geography: indeed, the plants were considered not only as individuals but with reference to their surroundings—a pioneer in the study of Ecology. In it he enumerates 1155 species of Flowering Plants and Ferns as well as the Mosses. (A large portion of the stock of this work was destroyed in the fire at Thirsk.) In 1866, with Dr G. R. Tate, he published a *Flora of Northumberland and Durham*. To complete the tale of the Floras we may say that in 1885 appeared *A Flora of* *the English Lake District*—a fascinating area which afforded him 50 Ferns, 850 flowering plants and about 100 adventive species. These Floras give evidence of his intimate knowledge of plants, their relation with the surroundings, of his gift of terse definition, apt generalisation, and of his knowledge of the altitudinal range of species. Ecology had its forerunner in Baker, and the information he gives is not too encumbered with uncouth terminology. His Monograph of the Roses has already been noted. This appeared in the *Naturalist* for 1863. In Seeman's *Journal of Botany* he wrote a paper on British Pansies in 1863, and in 1865 he published a paper on the English Mints, a sound and practical memoir, although at that time hybridity was not sufficiently taken into account. He grouped the Mints (omitting *Pulegium*) under 13 species, *alopecuroides* being placed under *sylvestris*, while *crispa* and *cardiaca* are kept distinct. The latter name was used in Johnson's *Gerard* of 1633 and revived by Baker two centuries afterwards. As we have seen, he was appointed to Kew in 1866, Oliver being then the keeper and Sir Joseph Hooker director. Britain was, however, too small an area to occupy his time for long. The great clearing-house of Kew demanded other work. In the *Journal of the Linnean Society* will be found a most important series of works from his pen—such are *The Flora of North China*, 1876; *The Flora of Madagascar* 1881-90, in which he describes 1200 new species; *The Flora of the Mauritius and the Seychelles*, 1887. He also specialised on certain groups, and there are monographs of the Scilleae, 1872; Tulipeae, 1873; Asparagaceae, 1884-5; Anthericeae, 1876; Iridacearum, 1877; Colchicaceae, 1879; Aloineae and Yuccoideae, 1880. He also contributed many popular monographs on these and other genera to the *Gardeners' Chronicle* and descriptions of new and rare plants to Saunders' *Refugium Botanicum*, of which he supplied the text for four out of the five volumes. In 1877 appeared as a separate work *A Handbook of the Fern Allies*, which contains six of his species of *Lycopodium* and about 130 of his Selaginellas out of the 334 enumerated—an astounding piece of work. His Handbook of the Amaryllideae appeared in 1888, that of the Bromeliacae in 1889. The Handbook of the Irideae in 1892, a volume of 232 pages, also contained a large number of new species. One wishes he could have prepared a more elaborate work with plates, treating as it does of such a handsome group of fashionable garden plants. He also contributed the Filices and Compositae to the *Flora Brasiliana*, and the Leguminosae to the *Flora of British India*; also to Oliver and Dyer's *Flora of Tropical Africa*, and the whole of the sixth vol. of the *Flora Capensis* is by him, in which he describes and names 1055 species and varieties. In 1890 he was made keeper of the Kew Herbarium, an office which he held for nine years. In 1907 he collaborated with Miss Wilmott in her beautiful and costly work *A Book on Roses*, the coloured plates of which have been drawn by Alfred Parsons. It must be added that he also largely helped in the preparation of Hooker's *Student's Flora*, the Rubi, Rosae and Hieracia being arranged by him. He also wrote the Botany for the *Victorian County History of Yorkshire* in 1907. In 1884-5 he occupied the presidential chair of the Yorkshire Naturalists' Union, the subject of his address being "Recent Progress in English Botany and Fathers of Yorkshire Botany." He lectured on Botany for many years to the London Hospital and to the Society of Apothecaries. Few botanists have better deserved the F.R.S. which was bestowed on him in 1878 or the Doctorate of Science given him, and not with undue precipitation, by Leeds last year. He was also a Medallist of the Linnean and Horticultural Society; a Vice-President of the Linnean Society and member of the Irish Academy. His name is commemorated in Botany by the genus *Bakeria*, a genus of the Bromeliaceae, and in a Loranthaceous genus—*Bakerella* of Van Tieghem, and there are many species named after him. The British ones include *Rosa Bakeri* Déség., *Rubus Bakeri* F. A. Lees, and *Galium Bakeri* Syme. The number of his published papers is very large (over 400), Christensen giving 83 on Ferns alone, and the number of species and varieties named by him run into many thousands. Even in his later years he could find time to write of the Flora of Burnham Beeches, and fascinating papers from his pen appeared in the *Gardeners' Chronicle* on the "Holy Land: its Botany and Physical Geography" as recently as 1917 (*Rep. B.E.C.* 319, 1919). Thus, full of years and honours, with all the laurels of a most industrious career, with the respect and affection of all those who knew him, our dear colleague passed away in the morning of August 16, 1920, and his body was laid to sleep in the Friends' Burial-ground at Isleworth. A wreath of monocotyledonous flowers, which had been specially the subject of his researches, was appropriately sent by the Kew staff to place upon his grave. My own acquaintance with him dates back to the early seventies, when he kindly helped me with critical plants, especially with Roses. Once in later years I met him at Thirsk as I was motoring through Yorkshire, and on more than one occasion he has been in Oxford, where he was delighted to see the beautiful specimens of Miller's glabrous Elm at Besilsleigh and the vegetation of the saline meadow at Marcham. His kindliness stands out as a striking trait in his character, as does his readiness to help others. This sometimes leads me to take greater trouble over a hopeless bundle of mixed-up fragments of squashed specimens which some contributors think are the proper material to send in for identification. Not only has the Society lost its Honorary Member but it has lost a wise counsellor and a sincere well-wisher. Note his kindly greeting on page 12 of the fifth volume of our 60th annual *Report*, when he concludes by offering "his best wishes for the continued prosperity of the Club," which he may be said to have re-established. Notices of Gilbert Baker's life appear in the *Naturalist* 5-8, 1907; in the *Friends' Quarterly Examiner* 454, 1920, by J. Burtt-Davy; in the *Gardeners' Chronicle* i., 102, 1920; the *Journal of Botany*, and the *Kew Bulletin*, No. 9, 1920, which contains the additional papers of Baker's to those in the Royal Society's Catalogues. See also *Kew Bulletin*, 1897 and 1907.

BELL, A. MONTGOMERIE. Born at Edinburgh, 1845; died at Oxford, 1920. The subject of this notice was the son of Mr W. S. Bell, the Regius Professor of Conveyancing in Edinburgh University. He was educated at the Academy of that city and at Glasgow University, and was a member of Balliol College, Oxford, from 1864-9, taking his degree in the latter year and his M.A. in 1871. He won several prizes in the sports. He lectured at Worcester College in 1869, and became a Master of Marlborough in 1870. Subsequently he lectured at St John's, Oxford, and undertook private tuition, among his pupils being Lord Haig. He was the author of several school books and he contributed to the *Cornhill* and other periodicals and newspapers. Recently he wrote a work on Johnson. His chief interest, however, lay in Anthropology. He made important discoveries and researches into the history of primitive man in Britain. In 1883 he discovered palaeolithic flint implements on the high plateau near the sources of the Darent and Eden, and this was followed in 1890 by his finding at Wolvercote, close to Oxford in the river gravels 100 feet above the present level of the Thames, a series of very fine palaeolithic implements, together with plant remains of that period. At Iffley, too, he discovered evidences of the existence of a large colony of palaeolithic men. In later years Mr Asquith granted him a pension from the Civil List. Mr Bell served as President of the Ashmolean Natural History Society in 1898-9. Among the plant remains referred to there was scarcely a species not now found in the neighbourhood of Oxford except what may be a leaf of the arctic willow. Mr Bell had always a love for Botany, and during the past 10 years he had been engaged in making a series of drawings of our British plants, several hundreds in number. These are very well done, with clear definite outlines and with the natural habit well portrayed. He was always ready to give assistance in any matter relating to this Society, for which he had a warm liking. For some years angina symptoms had troubled him. This year the writer, who had called on him, when he was on a visit to Oxford, in order to bring him to lunch, found that he had only recently been found dead in his rooms. Mr Bell had intensely strong Scottish affinities and a great sympathy with the Stuarts. It was perhaps the writer's championship of George Don which laid the foundations of an affectionate friendship of over 25 years, only broken by death. Quite recently, through his kindness, his brother's (John M. Bell) herbarium, which gained the Balfour prize for plants collected round Edinburgh about 1858, came into the possession of the writer. In person Mr Bell was tall and strongly built, and his goodly presence suggested that of a Scottish laird of the olden time though he never here wore the kilt.

CLARKE, HENRY. Born in London, July 18, 1858; died October 12, 1920. He was the son of Daniel Clarke and was educated as an architect at King's College. He proceeded to Guy's Hospital and, qualifying in 1874, was appointed Medical Officer to Wakefield Prison, which position he held till his retirement in 1908. In 1907 he took the M.D. of Durham. He was the author of many valuable medical papers. On his retirement he bought Courns Wood, near Naphill, in Bucks, where I made his acquaintanceship and saw his already considerable collection of water-colour drawings of British plants. This work occupied his leisure, although he gave freely of his time during the war to help his colleagues. He was an accomplished artist and loved books and their covers—for he was a good bookbinder. His plant-drawings are accurate and pleasing and number many hundreds. He also painted many fungi. His right hand was alone used in the work as he lost the use of the left some years ago. His death was very sudden. He had only recently sent, as was his custom, plants for identification from Cardigan. Many new records of his from that county have been published in our *Reports*.

COLGAN, NATHANIEL. Born May 28, 1851; died October 2, 1920. Mr Colgan was born in Dublin and became clerk to the Metropolitan Police of that city, an office he held till the age-limit. He was a good linguist and travelled in France, Switzerland, Italy and Morocco. A. G. More left him and R. W. Scully to complete and see through the press the second edition of *Cybele Hibernica*, which was published in 1898 and was very carefully and ably performed. In 1904 Colgan published a *Flora of Dublin*, a quite excellent production. He also contributed a paper on the occurrence of *Artemisia Stelleriana* on the North Bull to the *Journal of Botany*. There is an appreciative memoir with a portrait in the *Irish Naturalist* 125. 1920, by R. W. Praeger.

FARRER, REGINALD. Born 1880; died 1920. His almost tragic death from diphtheria in the wilds of Northern Burma or Tibet on October the 16th terminated a career of exceptional interest and brilliancy. He was the eldest son of Mr James Farrer of Ingleborough, and thus was nurtured amid beautiful scenery and among literary associations in his home life which doubtless fostered his own predilections. In his young days his health was delicate and thus he never had a public school education, being perhaps not only a loser but a gainer by the omission. He entered Balliol College in 1898, and under the auspices of his cousins, the Ansons, I made his acquaintance. At that time he was interested in Botany, but liked the flowers more for their own sakes than for their connection with a science. He took classical honours in his examination and then began a career of travel, which only ceased with his death. Under his guidance I saw *Arenaria gothica* at Clapham, which he had found in a new locality. On Ingleborough (see *Report* ii., 256; v., 592) he detected a hybrid Saxifrage between two such unexpected parents as *tridactylites* and *hypnoides*, which I connected with his name as × *S. Farreri*. Together we explored the Isle of Walney and saw *Geranium lancastriense* in all its beauty, and traversed Ingleborough and its limestone pavements. The next time we met was in a very different scene. It was at Kandy. He had recently taken the yellow robe, and had been staying with a native Rajah who, as I said, had all the gems of the world in his mines save the opal and diamond. "Ah, but," he said, "last night I saw some of the finest opals I have ever seen." Some of the finest in Britain, I remarked belonged to Mrs Gaskell. "Well" he said, "so small is the world, these were worn by Mrs Gaskell's daughter," the daughter of my valued friend, Captain Gaskell, of Kiddington, alas, now no more. Farrer then told me of his visit to the shrine in order to see Buddha's tooth, which is preserved in the Temple at Kandy. It is contained in casket after casket, each more costly than the other, seven in all, before the last is opened to expose this historic relic, which, however, some observers say grew in something much less venerable than the mouth of Buddha. We who were not Buddhists were not allowed to see for ourselves. At Kandy we met the Empress Eugenie, who, like us, went to visit the buried city of Anarudjapura with its great dagobas, which explained to us for the first time the two generic names *Buda* and *Tissa* used by Adanson for *Spergularia*. *Buda* being a variant of Budha, and *Tissa* is the Divina pie tissa to whom one of the dagobas, over three hundred feet high of brickwork, is dedicated. Farrer wrote several novels, but it was in his books of travel that he achieved his great success. For many years he had a rock-garden at Clapham, and in order to stock this with rarieties he made his journeys. They resulted in his adding a very large number (several hundreds) of new and interesting species, among which may be singled out for their beauty *Gentiana Farreri* and *Lilium Farreri*. Sir I. B. Balfour and W. W. Smith dedicated *Farreria*, a new genus of the Thymelaeaceae, in his honour. Many other species bearing his name have been described in the *Notes from the Royal Botanic Garden, Edinburgh.* He was awarded the Gill Memorial Medal of the Royal Geographical Society. *The Garden of Asia* and *On the Eaves of the World* stand apart from most works by their vivid, if not too ornate, word-painting. They, however, give the arm-chair botanist an opportunity of taking in some of the glories of a high-alpine flora in or on the confines of India. Still more recently his adventurous journey into China was detailed in the *Gardeners' Chronicle.* Many of his plants are described by himself in vol. xlii., p. 47-114, of the *Journal of the Horticultural Society.* His *Alpine and Bog Plants* appeared in 1908. His two volumes on *The English Rock Garden* were reviewed at length in our last *Report.* Who then could have anticipated that his life should so soon have closed? In some way, sad and premature as it was, it was more in consonance with his outlook than a passing away in a prosaic manner in a civilised surrounding. He loved the wilds, like the Scholar Gipsy. They took the toll; "he came to Oxford and his friends no more." There is a pleasant tribute to him in the *Gardeners' Chronicle*, with a portrait, ii., 247, 1920, and the same excellent publication contains several articles written by Farrer on his last journey.

JACKSON, JOHN READER, A.L.S. Born in Kent in 1837, he was educated for an architect, but being introduced to Sir William Hooker he was induced to join the scientific staff at Kew in 1858. For forty-three years he was at Kew, acting as keeper of the Economic Museum there, and excellently explained its contents to myriads of visitors. He was elected A.L.S. in 1868. He was the author of *Commercial Botany of the Nineteenth Century*, 1890, and of an *Official Guide to the Museum of Economic Botany*, 1883. and edited an issue of Barton and Castle's *British Flora Medica* in 1877. After his retirement he served for several years on the Exeter Diocesan Conference. He died at his residence, Claremont, Lympstone, on October 28th, aged eighty-three years.

MORETON, Lord. Henry Haughton Reynolds-Moreton, 1857-1920. The death of our member, the only son and heir of the Earl of Ducie, took place from bronchial pneumonia, at 37 Park Lane. on February 27, 1920. He was Liberal Member for West Gloucestershire from 1880 to 1885. His country residence (an inheritance from his mother, a Langton) was at Sarsden in Oxfordshire, and he frequently sent me notes on the local flora. His especial interest was in microscopic fungi. He found the *Tulipa sylvestris* near his residence. He inherited the love of horticulture and arboriculture from his father, whose ancestral domain at Tortworth has the largest Chestnut in Great Britain, besides some extraordinary fine specimens of other trees. Earl Ducie, F.R.S., who still survives, was born in 1827.

ROGERS, Rev. WILLIAM MOYLE. Born at Helston, July 12, 1835, died at Bournemouth, May 26, 1920. He was educated at Helston Grammar School, and without having had a University training was admitted to priest's orders in South Africa by Bishop Gray in 1861. Returning to England he was curate successively of Yarcombe, S. Devon (1862-4); Holy Trinity, W. Cowes (1865); Upton-on-Severn, Worcestershire (1866-7); Chetnole (1868-9) and Woolland, Dorset (1869-72), where he married a daughter of Major Chadwick, of Chetnole. He was Vicar of Stapleford, Wilts, in 1872; Curate of Trusham, Devon, 1876-82; and Vicar of Bridgrule, Devon, 1882-5 (teste Crockford), when his health, never robust, broke down, and he retired to Bournemouth, where he resided till his death. The frequent changes of residence gave him the opportunity, of which he took full advantage, of investigating the flora of many areas, and a long list of articles on them have appeared in the *Journal of Botany*. From this it will be gathered that, even if Rogers had not specialised on *Rubi*, his contributions to Topographical Botany would have been important. He rendered substantial aid to Mansel Pleydell's *Flora of Dorset*, to Murray's *Flora of Somerset*, and I owe him gratitude for his welcome notes for the *Floras of Oxfordshire and Berkshire*. He was an energetic member of the Record Club from 1877. He joined the Botanical Exchange Club in 1883, and from that time till last year he remained a member and acted as a most painstaking and conscientious referee on *Rubi*, of which he was the acknowledged British expert. This prickly genus in Smith's *English Flora* numbered 13 species in addition to *R. arcticus*, which is probably an error. Since that time many botanists tried to investigate them—Bell-Salter, Lindley, Bloxam, Hort, Lees, Bagnall, Coleman, Leicester-Warren, Briggs, and notably Babington, who published a Handbook in 1869 which enumerated 45 species. Moyle Rogers, after prolonged, laborious work, left our British *Rubi* at about 120. Among the new species described by him are *R. lacustris*, *Lettii*, *Leyanus*, *iricus*, *hibernicus*, *mollissimus*, *dunensis*, *anglicanus*, *echinatoides*, *raduloides*, *Griffithianus*, *dasyphyllus* and *Marshalli* (this with Focke), besides numerous varieties and sub-species. Since the publication of Rogers' *Handbook* in 1900 two important works on European *Rubi*, those of Focke and Sudre, have appeared. It is somewhat striking that not a single one of Rogers' species is included in the List of the 114 major European species given by Sudre; those mentioned being accorded a subordinate position as minor subspecies, or even lower grades. Whatever may be their ultimate position, one knows that it was only after the closest examination of specimens and minute and careful study that Moyle Rogers ventured to describe new species. Whether he took sufficiently into account the effects of recent or past hybridisation may be open to discussion, but this is neither the time nor the place to develop the question. One thing is obvious, that in a workable arrangement there must be greater grouping and a probable reduction in the number of major species than at present obtains. Moyle Rogers was at one time strongly drawn to the Roses, on which he did useful work. *Rubus Rogersii*, named in his honour by the Rev. E. F. Linton, although not given by Sudre among the numbered European species, is placed subordinately to *R. affinis* W. & N. by Sudre, and not as a hybrid or variety. Focke gave it specific rank. Moyle Rogers was one of the kindliest of men. He was gentle and considerate of others, disliked controversy, was the reverse of dogmatic, and was most painstaking, industrious and careful. The loss to this Exchange Club is indeed a grievous one, but he did his best to make it less severe by cheerfully putting his specimens and knowledge and experience at the service of the Rev. H. J. Riddelsdell, whom he wished to be his understudy. His own son, the Rev. F. A. Rogers, has his father's love of the science and has himself done most excellent work in African Botany. Although retired from parochial work, our member's services were always cheerfully given to the various parishes in Bournemouth, and the same kindly disposition which characterised his botanical life was eminently manifest in his sacred calling.

STANTON, GEORGE, 1840-1920. Born at Bramley, near Guildford, he became a gardener at Rydinghurst: Knowle Royal Garden, Windsor; Kew, and eventually at Park Place, Henley. There he made notes on the local flora in the three counties, which I have been glad to utilise. He had a large number of men under his control, and was an acknowledged authority on horticulture. In 1918 he was elected President of the Kew Guild, and the French Government in 1911 nominated him as Chevalier du Mérite Agricole. He died on the Park Place Estate on March 14, 1920.

STEDMAN, FRANK WILLIAM, chemist, Ashford, Kent, died suddenly on November 12, 1920. He was apprenticed at Cirencester, and on his taking a business at Ashford interested himself in local Botany. He found the Lizard Orchis in his neighbourhood and knew the localities of the Kentish members of that genus.

Botany has lost also three distinguished continental systematists:—

BECCARI, ODOARDO, 1843-1920, Director of the Botanic Garden at Florence. He was a great authority on Palms and an explorer in Malay and New Guinea, which resulted in the publication of three large volumes, 1877-86, of *Malesia*. Other works are *Palme del Madagascar*, 1912, and in the *Annals of the Royal Botanic Garden, Calcutta*, *Asiatic Palms—Lepidocaryeae*, with over 400 plates.

DE CANDOLLE, AUGUSTIN PYRAMUS. Born in England in 1869; died at Geneva, May 8, 1920, only eighteen months after his distinguished father. He was the fourth generation of a great botanical family. His botanical output does not compare with that of his predecessors, but his systematic work included descriptions of Tonkin and Madagascar species.

SACCARDO, PIER ANDREA. Born at Treviso, 1845; died 1920. Director of the Botanic Garden, Padua, and Emeritus Professor in the University there. He was a recognised authority on Fungi. His *Sylloge Fungorum* is a monumental work extending to 22 volumes which appeared from 1882 to 1913. In them an enormous number of new species are described. He is also the author of the *Cronologia della Flora Italia*, a companion volume to the *Flora Analitica d'Italia* of Fiori, Paoletti, and Beguinot, in which he gives the earlier records for Italy of the flowering plants and ferns. He, however, omitted any reference to the very early herbal of Gregory of Reggio, 1606, which is at Oxford. He also wrote *Chromotaxia*, a book on colour nomenclature.

NEW COUNTY AND OTHER RECORDS.

ABBREVIATIONS.—*Rep. B.E.C.* = *Report of the Botanical Society and Exchange Club*: *Wats. B. E. C.* = *Report of Watson Botanical Exchange Club*; † = Adventive; * = New County Record (in the case of adventive plants this is only rarely added); ! placed after a plant signifies that the compiler has seen a specimen; ! placed after a locality that the compiler has seen it there; × placed between two scientific names means that the plant is a hybrid; 52, &c., numbers following a county, refer to the Watsonian vice-county in *Topographical Botany*; [ ] enclosing a record mean that confirmatory evidence is needed.

1. CLEMATIS VITALBA L. Irfon Bridge, Builth, Brecon, introduced, WEBB.

3. THALICTRUM FLAVUM L., var. RUFINERVE (Lej. & Court.). Denbighshire, E. F. PAYNE. This is similar to the Llansilin plant, so named by Rev. E. F. Linton, but which Herr J. Freyn referred to *T. gallicum*. Our Thalictra sadly need revision. The *Cambridge Flora* gives no varieties of *flavum*.

†14. ADONIS AESTIVALIS L. Near Wilmington, Hull, York, W. JOHNSON.

†16. A. ANNUA L. St H lier, Jersey, 1858, PIQUET.

*21. RANUNCULUS AURICOMUS L. St Ouen's, Jersey, 1890, PIQUET.

27. R. ARVENSIS L. Near Chepstow, Monmouth, *Fl. Chepstow*.

36. R. FLUITANS Lam. In the Axe, Axminster, Devon, Miss TODD.

*38. R. TRICHOPHYLLUS Chaix. Braid Ponds, Midlothian, 1858, BELL, in *Hb. Druce.*

39 (2). R. SPHAEROSPERMUS Boiss. & Blanch. St Osyth, Essex, 1912 [Ref. No. 7], BROWN.

40. R. HETEROPHYLLUS Weber, var. TRIPHYLLUS (Wallr.). Ford, Bucks, DRUCE; Raynes Park, Surrey, BRITTON. Var. SUBMERSUS Godr. Newport, Isle of Wight, STRATTON; Beardsall, Derby, ANSELL.

*42. R. BAUDOTII Godr. Farming Woods, Northants, 1875 DRUCE. Var. MARINUS (Arr. & Fr.). Brick ponds near the sea, Cardiff, Glamorgan, RICHARDS.

47. R. FICARIA L. Plentiful in Unst, SAXBY. Forma LUXURIANS Moss. Hertford, ANSELL.

51. HELLEBORUS VIRIDIS L. *Magor Llanfihangel, Monmouth, *Fl. Chepstow*; near Leominster, Hereford, DALTRY.

*54. AQUILEGIA VULGARIS L. With white, purple and blue flowers on the railway embankment, Falgarth, Brecon, WEBB.

†72. BERBERIS VULGARIS L. St Martin's, Jersey, PIQUET. Rejected in the *Flora of Jersey.*

77. CASTALIA ALBA Wood, var. OCCIDENTALIS Ostenf. Near Walls, Shetland, DRUCE. Passed by OSTENFELD.

80. PAPAVER RHOEAS L., var. CAUDATIFOLIUM Fedde. Neithrop, Oxon; Southam, Warwick; Castle Hedingham, Essex, DRUCE; Belsize Park, with var. SUBINTEGRUM W. & L., var. TRIFIDUM Fedde, Croxley Green, Herts, RICHARDS. Var. STRIGOSUM Boenn. Godalming, Surrey, BISHOP.

†90. GLAUCIUM CORNICULATUM Curt. St Ouen's, Jersey, with

other casuals, PIQUET. Given in *Camb. Fl.* as if native there, but it is only adventive and has disappeared..

†95. HYPECOUM PROCUMBENS L. Near Wymondham, Norfolk. Miss POMEROY.

†100. CAPNOIDES SOLIDA Moench. Albury Park, Surrey, BISHOP.

104. FUMARIA CAPREOLATA L., var. BABINGTONII Pugsley. John o' Groats, Caithness, DRUCE.

106. F. PURPUREA Pugsley. Llandrindod Wells, Radnor, Miss TODD.

107. F. BORAEI Jord., var. GRACILIS Pugsley. Barnes Common, Surrey, as *muralis*, GROVES. Var. BRITANNICA Pugsley. Ide, Devon, Miss TODD. Var. LONGIBRACTEATA Pugsley. Church Stretton, Salop, 1907, C. BAILEY.

108. F. MURALIS Sond. The Jersey record may be deleted, Piquet's specimen is *F. Bastardi*.

*108 (3). F. MARTINI Clav. (F. PARADOXA.) Near Bath, Somerset, Mrs SANDWITH.

†116. MATHIOLA INCANA Br. Wooläcombe, N. Devon, 1920, naturalised, Mrs DRUMMOND. Also quite naturalised and in quantity on the *Fort, St Helier, Jersey, and, as a garden escape, on the sands near Pontac, Jersey, 1920, DRUCE.

†119. M. BICORNIS Br. Waste ground, Sutton's Farm, Reading. MURRAY.

*124. RADICULA SYLVESTRIS Druce. Penrhyndeudraeth, Merioneth, JONES.

142. CARDAMINE PRATENSIS L. A beautiful flore pleno form, which kept true in cultivation, was found at Beardsall, Derbyshire. in 1846, by WHITTAKER, in *Hb. Ansell*. Mr D. HAMER sent from

Carmarthen a leaf showing the buds on the margin of the leaflet, and a similar specimen was found by Miss DRUMMOND near Hampton Court. At Syredale in the Orkneys, and also in Unst, it was in good fruit.

[160. DRABA RUPESTRIS Br. Mr Temperley and his son gathered a single specimen on Widdybank, which has much the same aspect as the Ben Lawers plant. *D. incana* was plentiful there. It will be well to bear it in mind].

*167. COCHLEARIA OFFICINALIS L. On the muddy coast of the Dorey, Montgomery, WEBB.

†176. HESPERIS MATRONALIS L. Near the Barracks, Kilkenny, Hon. Mrs FIENNES.

†184. SISYMBRIUM ALTISSIMUM L. Norwich, E. Norfolk, W. G. CLARKE.

†187. S. LOESELII L. Gartcosh, Glasgow, GRIERSON.

†188. S. IRIO L. Felixstowe, E. Suffolk, 1920, M. COBBE. The third time for that county.

†200. CONRINGIA ORIENTALIS Dum. Aldeburgh, E. Suffolk, A. B. COBBE; Denbigh, B. ALLEN.

202. CAMELINA SATIVA Crantz. Leven Links, Kinross, 1857, BELL.

202 (2). C. ALYSSUM (Mill.) Thell. = FOETIDA Fr. St Davids, Fife, BELL.

†218. BRASSICA JUNCEA Coss. Thetford, W. Norfolk; Felixstowe, E. Suffolk, M. COBBE; Pembrey, Carmarthen, HAMER; Kirkwall, Orkney, DRUCE.

†222. B. POLLICHII (Sch. & Sp.) Druce. Rewley, Oxon, GAMBIER-PARRY; Pembrey, Carmarthen, HAMER; Lakenheath, W. Suffolk; Felixstowe, E. Suffolk, A. B. COBBE.

†223. B. ERUCASTRUM L. Carmarthen, HAMER.

*†227. DIPLOTAXIS MURALIS DC. Finstown, Orkney, DRUCE and JOHNSTON. Var. BABINGTONII. Pembrey, Carmarthen, HAMER.

232. BURSA BRITTONII (Almq.). Haroldswick, Shetland, DRUCE.

*233. CORONOPUS DIDYMUS Sm. Felixstowe, E. Suffolk, M. COBBE; Botley, Oxford, DRUCE; railway station, Edinburgh, 1857, BELL.

236. LEPIDIUM LATIFOLIUM L. Abundant at Felixstowe, E. Suffolk, M. COBBE.

†237. L. DRABA L., var. SUBINTEGRIFOLIUM Mich. Par, Cornwall, THURSTON. Sub-var. VIRIDESCENS Druce. Near Carmarthen, HAMER.

†239. L. PERFOLIATUM L. Felixstowe, E. Suffolk, M. COBBE, Exmouth, S. Devon, Mrs WEDGWOOD; St Ouen's Bay, Jersey, 1901, *Hb. Piquet*; Cirencester, Gloster, GREENWOOD; *Kirkwall waterworks, Orkney, DRUCE.

†240. L. RAMOSISSIMUM Nelson. Mile Camp, North Stoneham, S. Hants, RAYNER; Glasgow, GRIERSON.

†240 (2). L. NEGLECTUM Thell. Glasgow, GRIERSON; Felixstowe, E. Suffolk, M. COBBE.

246. L. SMITHII Hook. A plant very near to *alatostylum* Towns., was found at the Lizard, Cornwall, 1920, by Miss TODD.

†247. L. VIRGINICUM L. St Peter's Valley, Jersey, 1901, PIQUET; Thetford, W. Suffolk, Miss COBBE.

†247. L. DENSIFLORUM Schrad. Ide, Devon, Miss TODD; Chichester, W. Sussex, DRUCE; Charleston, Cornwall, Mrs WEDGWOOD; Thetford, W. Suffolk, Miss COBBE; Mickleham, Surrey, BISHOP.

252. IBERIS AMARA L. Church Hill, Royston, Herts, sent as *ruficaulis*, J. E. LITTLE, in *Wats. B.E.C.* 1913. Thellung refers this to var. DECIPIENS (Jord.) Thell. in 1920.

†253. I. UMBELLATA L. St Saviour, Jersey, 1852, as *amara* (See *Flora*), PIQUET; Burntisland, Fife, 1858, BELL.

†256. ISATIS TINCTORIA L. This came up (1897) after the moving of some earth in making a new footpath. In Lincolnshire it is now only grown on estuarine alluvium. WOODRUFF-PEACOCK, *in litt.*

†258. VOGELIA PANICULATA Horn. Aldeburgh, E. Suffolk, M. COBBE; Lifton, N. Devon, W. WISE.

†262. BUNIAS ERUCAGO L. Tollcross sand-pits, Glasgow, GRIERSON; West Mount, Jersey, PIQUET.

264. CRAMBE MARITIMA L. Barton Bradstock, Dorset, GRAVESON.

†266. RAPISTRUM PERENNE All. Guildford, Surrey, DRUCE.

†267. R. ORIENTALE DC. Medway Bank, Aylesford, Kent, TALBOT.

†268. R. RUGOSUM All. Felixstowe, E. Suffolk, A. B. COBBE.

291. VIOLA STAGNINA Kit. Near Drumcose Post Office, Fermanagh. STEELE, in *Irish Nat.* 95, 1919.

293. V. SYLVESTRIS Kit., var. PUNCTATA Druce. Alphamstone, etc., N. Essex; Hitcham, W. Suffolk; Wentbridge, S. E. Yorks, BROWN; Brampton, Cumberland, BELLAMY.

294. V. RIVINIANA Reichb., f. NEMOROSA Neum. Pebmarsh, Great Tey, N. Essex, BROWN; St Ouen's, Jersey, DRUCE. Forma MINOR Murbeck. Fordham Heath, N. Essex; Bromeswell Walks, W. Suffolk, BROWN. × CANINA. Oakvale, Liverpool, 1843, H. SHEPHERD.

*295. V. RUPESTRIS Schmidt, var. GLABRESCENS Neum. The stipules are not broad enough to be quite characteristic. La Moye, Jersey, DRUCE. On the serpentine at Baltasound, Unst, new to Scotland, DRUCE; Linton, Cambridge, BROWN; Upper Wharfedale, W. Yorks, 1918, WATERFALL; Torquay, S. Devon, Miss LARTER.

296. V. CANINA L. *Near Tintern, Monmouth, *Fl. Chepstow*; in a cleistogamous state at Waulkmill Bay, Orkney, DRUCE. *Var. ERICETORUM (Schmidt). La Moye, Jersey, 1920, DRUCE. Var. PUSILLA Bab. *La Moye, Jersey, DRUCE; Fordham Heath, N. Essex, BROWN; Sands of Barry, Forfar, 1844, GARDINER. × LACTEA. Spurn Head, E. Yorks, 1898, WATERFALL, in *Hb. Brown*. Mrs Russurim sent from the Norfolk Breckland to Lady Davy, 'Miss Pallis's Violet.' See *Brit. Violets*, p. 82.

298. V. ODORATA L., var. DUMETORUM (Jord.). Alphamstone, N. Essex, BROWN; St Saviour, Jersey, 1852, PIQUET, in *Hb. Druce*. At Baldon, Oxford, a form with an abnormal development of stoloniferous flowers occurred, and Mr Foggitt sent the same from Thirsk. × HIRTA = SEPINCOLA. Edwardstone, W. Suffolk, BROWN, Worcester, 1853, T. GISSING, in *Hb. Piquet*. × HIRTA = MULTICAULIS Jord. Lockley's Warren, Herts, 1876, BLOW, in *Hb. Piquet*.

299. V. HIRTA L., var. HIRSUTA Lange. Hertford, ANSELL, an *imberbis* form.

*300. V. CALCAREA Greg. Tidenham, W. Gloster, RIDDELSDELL, in *Fl. Chepstow*.

*301 (2). V. EPIPSILA Ledeb. Hartlebury Common, Worcester, 1855, T. GISSING, as *palustris*, in *Hb. Druce*; Chepstow Park, Monmouth, *Fl. Chepstow*.

306. V. CURTISII Forst., *var. PESNEAUI R. & F. Mochras, Merioneth, JONES; Santon Warren, Norfolk, REYNOLDS. New to Norfolk. I gathered it near Brandon in Suffolk.

319. DIANTHUS ARMERIA L. Wacton, Norfolk, CLARKE; Bouley Bay, Jersey, 1903, PIQUET, as *D. deltoides*.

336. SILENE CUCUBALUS Wib., †var. ROSEA (DC.). Colchester. BROWN.

*338. S. CONICA L. In great abundance on the dunes at Pembrey, Carmarthen, HAMER.

†339. S. CONOIDEA L. Jersey, HUNNYBUN, in *Camb. Fl.* as if native, but it is merely alien.

†340. S. NOCTIFLORA L. Between Crick and Mount Ballan, Monmouth. *Fl. Chepstow.*

†341. S. DICHOTOMA Ehrh. Llanelly, Carmarthen, HAMER: St Ouen's, Jersey, 1901, PIQUET.

†343. S. ANGLICA L. Lydney, W. Gloster; Kilgwrrwg, Monmouth, *Fl. Chepstow.*

†344. S. QUINQUEVULNERA L. Golf links, Felixstowe, E. Suffolk, M. COBBE.

†350. S. MUSCIPULA L. Ibrox, Lanark, GRIERSON.

†356. S. ANNULATA Fenzl. Field near St Lawrence Church, 1857; St Ouen's, Jersey, 1901, PIQUET.

†364. LYCHNIS CORONARIA L. Langland, Glamorgan, WEBB; Marston, Oxon, DRUCE.

370. CERASTIUM VULGATUM L., var. LUCENS Druce. On the serpentine at Balta, Unst, the same as the Cabrach plant. DRUCE.

372. C. PUMILUM Curt. On ant heaps, on Ilsley Down, Berks, 1920. Not seen since I first found it in that area in 1885, DRUCE; *Newport, Pembroke, DRUCE; *Great Orme, Carnarvon, REYNOLDS, a great extension of its range.

*373. C. SEMIDECANDRUM L. Portskewett, etc., Monmouth, *Fl. Chepstow.*

374. C. TETRANDRUM Curt., var. ZETLANDICUM Murb. Balta, Unst, DRUCE.

394. Arenaria tenuifolia L. Charlestown, Cornwall, probably adventive, Tresidder. Var. laxa (Jord.). Thetford, W. Norfolk, M. Cobbe. Var. hybrida (Vill.). Rondham, W. Norfolk, M. Cobbe.

*399. Sagina nodosa Fenzl. Between Howey and Vanelwedd, Radnor, Webb. Var. moniliformis. *Baltasound, Unst, Shetland, Druce.

401. S. subulata Presl, var. glabrata Lange. Near Burga Water, Shetland.

*406 (2). S. Reuteri Boiss. Penarth, Glamorgan, 1909, Trow, in *Herb. Brit. Mus.*, ex Pearsall.

410. Spergula sativa Boenn. Lochgelly, Fife, Bell.

†418. Claytonia sibirica L. Woods at Armidale, Skye, Miss Flora Russell.

†419. C. perfoliata Donn. St Clement, Jersey, 1908. *Hb. Piquet.*

*421. Montia fontana L. = M. lamprosperma Cham., var. boreorivularis Druce. Burrafirth, Unst, Druce.

*421 (2). M. verna Neck., var. intermedia (Beeby). Brecon Beacons, Barton.

424. Elatine hexandra DC. Cym Bychan, Harlech; Llyn Tecwyn, Merioneth, Jones.

†426. Hypericum hircinum L. Highcliffe, near Christchurch, S. Hants, 1919, Bishop.

†427. H. elatum Ait. Carmarthen, Hamer.

435. H. quadrangulum L. A form with something of the appearance of *Desetangsii*, near Hartford Bridge, Hants, Lady Davy and Mrs Thompson.

†439 (4). MALOPE HISPIDA Cav. Cultivated field, Beaminster, Dorset, GRAVESON.

†441. ALTHAEA ROSEA L. Langland, Glamorgan, WEBB.

†442. A. OFFICINALIS L. Edge of the canal, near Byfleet, Surrey, 1920, two large clumps, BRITTON.

†*443. A. HIRSUTA L. St Ouen's Bay, Jersey, PIQUET.

452. MALVA SYLVESTRIS L., var. ANGUSTILOBA Celak. With periwinkle-blue flowers, at Thetford Camp, W. Suffolk, A. B. COBBE.

†*458. M. CRISPA L. St Peter's Common, Jersey, PIQUET.

*463. TILIA PLATYPHYLLOS Scop. Castle Woods, Monmouth, *Fl. Chepstow*.

*467. LINUM ANGUSTIFOLIUM Huds. Tintern, etc., Monmouth, *Fl. Chepstow*.

†468. L. USITATISSIMUM L., sub-var. ALBIFLORA. Leith Docks, in some quantity, FRASER.

469. L. ANGLICUM Mill. Aylmerton, E. Norfolk CLARKE.

†479. GERANIUM PHAEUM L. Braunceston, E. Norfolk, CLARKE.

†479 (2). G. ENDRESSI Gay. Ilfracombe, N. Devon. *Dev. Rep.*, 1, 1920.

*481. G. PYRENAICUM Burm. f. Tintern, Monmouth, *Fl. Chepstow*.

*485. G. ROTUNDIFOLIUM L. Old gravel pit at Postfield, near Chichester, W. Sussex, BURDON. Subsequently we found it in quantity south of the city in hedges. Old Town Wall, Chepstow, Monmouth. *Fl. Chepstow*.

488. G. ROBERTIANUM L., sub.-sp. CELTICUM Ostenf. Galway, 1920, Mrs EVANS.

497. ERODIUM PIMPINELLIFOLIUM Sibth. Near Exeter, Devon, Miss TODD.

†505. OXALIS CORNICULATA L., forma. Carmarthen, D. HAMER.

†506. O. STRICTA L. Bewdley, Worcester, 1855, T GISSING, in *Hb. Druce.*

†508. ? O. VIOLACEA L. Llanstephan Green, Carmarthen, HAMER.

†513. IMPATIENS GLANDULIFERA Royle. By Rheydder Bridge, side of Wye, Radnor, WEBB; Silverton, near Exeter, D'URBAN.

529. LUPINUS ANGUSTIFOLIUS L. Thetford Camp, W. Suffolk, A. B. COBBE; perhaps this near Kidwelly, Carmarthen, HAMER.

534. GENISTA PILOSA L. Found by D. A. JONES in a new station in 1901 on Cader Idris range, *i.e.*, Gan Graig, Merioneth.

*539. ULEX MINOR Roth. Epping Forest, S. Essex, 1844, ANSELL.

543. ONONIS REPENS L., var. HORRIDA Lange. Barnham, W. Suffolk, ROBINSON; Carmarthen, not uncommon, HAMER.

†548. TRIGONELLA FOENUM-GRAECUM L. Colchester, 1920, BROWN.

†550. T. POLYCERATA L. Felixstowe Docks, E. Suffolk, M. COBBE.

†*562. MEDICAGO FALCATA L. Kirkwall, Orkney, DRUCE. Var. TENUIFOLIOLATA Vuyck. Felixstowe Docks, E. Suffolk, A. B. COBBE.

†579. M. HISPIDA Gaertn., var. APICULATA (Willd.). Anniesland, Glasgow, GRIERSON.

†581. M. MINIMA Desr. On the coast near Seascale, Cumberland, probably introduced in the wool of sheep or fur of rabbits from a torpedoed vessel. The carcases drifted on to the shore which later afforded this and *M. denticulata.* R. HELLON.

†584. M. CILIARIS Krock. Leith, FRASER.

586. M. LUPULINA L., var. UNGUICULATA Ser. Guestling, E. Sussex, GRAVESON, GREGOR, and REDGROVE; West Drayton, Middlesex, L. B. HALL. See *Rep. B.E.C.* 551, 1910, where I gave the description.

†592. M. SULCATA Desf. Felixstowe Docks, E. Suffolk, M. COBBE.

†*593. MELILOTUS OFFICINALIS Lam. Kirkwall, Orkney, DRUCE.

†597. M. INDICA All. Bitterne Park Brickfield, S. Hants, RAYNER; Glamorgan, WEBB.

599. TRIFOLIUM PRATENSE L., var. PARVIFLORUM Bab. Between Ware and Stanstead, Herts, 1846, ANSELL.

†602. T. OCHROLEUCON Huds. Gravel pit, Chichester, BURDON.

†*604. T. HIRTUM All. Byfleet, Surrey, Lady DAVY. Det. TURRILL.

*620. T. SUBTERRANEUM L. In a sown lawn at Tenby, Pembroke, ? introduced, ARNETT.

†623. T. TOMENTOSUM L. Cultivated ground near Malvern, Worcester, TOWNDROW; Colchester, BROWN.

*628. T. REPENS L., var. RUBESCENS Seringe. Near Hungerford, Berks, 1919, Major BATES VAN DE WEYER.

†635. T. AGRARIUM L. Glasgow, GRIERSON.

641. ANTHYLLIS VULNERARIA L., var. OCHROLEUCA Corb. Common about Plemont, Jersey; Baltasound, Unst, DRUCE.

646. LOTUS ULIGINOSUS Schk., var. GLABER Bréb. Potterne, Wilts, GWATKIN; Kirkwall, Orkney, DRUCE.

653 ASTRAGALUS GLYCYPHYLLOS L. Near Welbeck, Notts, GOULDING, sine pers. auth.

†666. CORONILLA VARIA L. Gravel pit near Wymondham, Norfolk, Miss POMEROY; slag heap, Grosmont in Eskdale, Yorks, T. C. TAYLOR; Degenham, Essex, L. B. HALL.

†667. C. SCORPIOIDES Koch. Hertford, GRAVESON.

†*670. ORNITHOPUS PINNATUS Druce. St Ouen's Bay, Jersey, 1854, PIQUET.

†673. ONOBRYCHIS VICIIFOLIA Scop. Quenvais, Jersey, 1857, *Hb. Piquet.*

†690. VICIA NARBONENSIS L. Hertford, GRAVESON, with var. SERRATIFOLIA; also both at Colchester, BROWN.

†691. V. LUTEA L. Needwood Forest, Staffs, Sir ROGER CURTIS.

†695. V. MELANOPS S. and S. Hertford, GRAVESON.

698. V. ANGUSTIFOLIA L., sub-var. ALBA. Bramshill, N. Hants, Mrs THOMPSON; Briton's Pond, Guildford, Surrey. CLARKE, ex KENNEDY. A very pretty plant which is to be tested in culture. Var. ACUTA Pers. Kirkstall, Yorks, PULLAN. Var. GARLANDII Druce. The Quenvais, Jersey, DRUCE.

†706. V. GRACILIS Lois. Near Goring, Oxford, Miss NEILD.

712. LATHYRUS MARITIMUS Big. In great abundance near Bawdsey Ferry, E. Suffolk, M. COBBE. Persistent search at Burrafirth, Unst, failed to discover the var. ACUTIFOLIUS, the only station for this variety, DRUCE.

†718. L. HIRSUTUS L. Needwood Forest, Staffs, Sir ROGER CURTIS.

†*721. L. CICERA L. Amongst grass, on the margin of a cornfield, Sawbridgeworth, Herts, 1846, G. WOLSEY; Don Bridge, Jersey, 1905, PIQUET.

†723 (2). L. HIEROSOLYMITANUS Boiss. Near Hull, 1920, JOHNSON; Colchester, BROWN.

†724. L. OCHRUS L. Felixstowe Docks, E. Suffolk, M. COBBE; Colchester, 1780, BROWN.

†726. L. APHACA L. Near Hull, Yorks, JOHNSON. The pale-flowered form at Pyrford, Surrey, Lady DAVY.

729. L. MONTANUS Bernh. A very broad-leaved and strong plant, near Southam, Warwick, DRUCE & KING.

738. PRUNUS CERASUS L. Beachley, etc., W. Gloster, *Fl. Chepstow*.

740. P. INSITITIA L. Killin, M. Perth. DRUCE & FRASER; *Castle Woods, etc., Monmouth, *Fl. Chepstow*.

*753. RUBUS PLICATUS W. & N. Tiptree Heath, N. Essex, BROWN.

*778. R. SELMERI Lindeb. Stanway, N. Essex, BROWN.

*782. R. LEUCANDRUS Focke. Taw Valley, below Belstone, S. Devon, BARTON.

*785. R. GODRONII Lec. & Lam. Danbury Common, S. Essex. BROWN.

*791. R. MACROPHYLLOIDES Génév. West Cleave Wood, Okehampton, S. Devon, BARTON.

*814. R. VESTITIFORMIS Rogers. Park Corner, Oxon, DRUCE.

*830. R. NEWBOULDII Rogers. Stanway, etc., N. Essex, BROWN.

*832. R. PODOPHYLLUS P.J.M. Bar Hill Wood, Staffs, DALTRY.

*842. R. MACROSTACHYS P.J.M. Stanway, N. Essex, BROWN.

*850. R. INFECUNDUS Rogers. Bentley, E. Suffolk, BROWN.

861. R. VIRIDIS Kalt. Park Corner, Oxon, DRUCE.

†877. R. LACINIATUS Willd. Somer Norton, Somerset, Mrs THATCHER; Lessness, Kent, in a large wood, St. J. MARRIOTT.

†878. R. SPECTABILIS Pursh. Arrochar, Dumbarton, GRIERSON.

883. GEUM RIVALE L. A pretty monstrosity with a sessile flower in the leaf axil, was sent by Mr Philip Burtt from Mr S. Hobhouse. It came from the high limestone hills about a mile south of Hawes, at 1200 ft. altitude. × G. INTERMEDIUM Ehrh. Catcombe Wood, near Calne, Wilts, Lady DAVY & Mrs COLVILLE.

†885. FRAGARIA MOSCHATA Duchesne. Hernstone Lane, Bridgend, Glamorgan, Hon. Mrs A. LEITH.

886. F. VESCA L., var. SYLVATICA. Teviotbank, Kelso, Roxburgh, 1894, BAILEY, as *elatior*.

†887. F. CHILOENSIS Duchesne. Mumbles Railway, Glamorgan. WEBB.

†892. POTENTILLA RECTA L. Boar's Hill, Berks, 1914, DRUCE; also in 1919, by Major BATES VAN DE WEYER; Millbrook, Jersey, 1851, PIQUET.

†906. P. NORVEGICA L. Aldeburgh and Felixstowe, E. Suffolk; Thetford, W. Norfolk, M. COBBE.

*909. ALCHEMILLA ACUTIDENS Buser. Between Grassington and Conistone, M.-W. Yorks; Cross Fell, Westmoreland; Glen Falloch, W. Perth (Marshall), C. E. SALMON, in *Journ. Bot.* 113, 1920.

909. A. PRATENSIS Schmidt. Near Caswell Wood, W. Gloster, 1895, BAILEY.

†910. A. ARGENTEA Don. Still on the grass lawn of the Hotel at Unst, and one plant in the adjoining field. Certainly introduced. DRUCE.

913. AGRIMONIA EUPATORIA L., var. SEPIUM Bréb. Littleworth Common, Surrey, BRITTON.

914. A. ODORATA Mill. Behind Gorey Castle, Jersey, 1851, PIQUET; Tintern, Monmouth, *Fl. Chepstow*.

†918. POTERIUM POLYGAMUM W. & K. West Mount, Jersey, 1906, DRUCE.

†924. ROSA GALLICA L. Hortal. Castle green, Kirkwall, Orkney, DRUCE.

928. R. ANDEGAVENSIS Bast. Twinstead, N. Essex, DRUCE.

929. R. ASPERNATA Déség. A plant near this at Highnam, W. Gloster, GAMBIER-PARRY; Twinstead, N. Essex, DRUCE.

942. R. OMISSA Déség. Great Bedwyn, N. Wilts, HURST.

†*944. R. POMIFERA Herrm. Dolgelley, Merioneth, GAMBIER-PARRY.

966. CRATAEGUS MONOGYNA Jacq., var. INCISIFOLIA Druce. Chichester, W. Sussex; Twinstead, N. Essex; near St Albans, Herts, DRUCE. Var. QUERCIFOLIA Loud. Dartmouth, S. Devon; Appledrum, W. Sussex, DRUCE.

†972. COTONEASTER MICROPHYLLA Wall. On the railway bank, Hangleton, Sussex, Miss COTTIS; abundant at Dolygaer, Brecon, WEBB; Tidenham, W. Gloster, *Fl. Chepstow*.

†993. SAXIFRAGA SIBTHORPII Boiss. Garden weed at Winchester, Miss WILLIAMS.

1001. RIBES GROSSULARIA L. A curious sterile form, Madeley Bar, Staffs, DALTRY.

1011. SEDUM RUPESTRE L. St Helier, Jersey, 1851, PIQUET.

†1018. S. DASYPHYLLUM L. Near St Asaph, Denbigh, WEBB.

†1023. S. SPURIUM Bieb. Waste place, Lordswood, Southampton, RAYNER.

1025. S. ROSEUM Scop. First evidence for Carmarthen. Black Mountain, 1859, GISSING.

*1027. DROSERA ANGLICA Huds. Over a dozen large plants in a bog in the west of Merioneth, JONES.

1030. HIPPURIS VULGARIS L. *Warren, Harlech, Merioneth. JONES; very small specimens near Haroldswick, Unst, DRUCE.

1033. MYRIOPHYLLUM ALTERNIFLORUM DC. Canal at Lichfield, Staffs, DRUCE.

1036. CALLITRICHE OBTUSANGULA Le Gall. First evidence for Jersey, St Peter's, 1852, as *verna*, PIQUET.

*1037. C. PALUSTRIS L. Fairwater, Glamorgan, RIDDELSDELL, in *Journ. Bot.* 113, 1920.

1038. C. POLYMORPHA Lönnr. (Named by A. Bennett). Chipping Campden, E. Gloster, RIDDELSDELL, in *Journ. Bot.* 113, 1920.

1039. C. INTERMEDIA Hoffm. Fine specimens in canal, Cirencester, Gloster, GREENWOOD; first evidence for Glamorgan, Swansea, 1859, as *autumnalis*, GISSING.

*1040. C. AUTUMNALIS L. Eddleston, Peebles, 1857, BELL, in *Hb. Druce.*

1042. PEPLIS PORTULA L. *Gors Llwyn, Brecon, WEBB; near Estaline, Orkney, DRUCE.

*1045. LYTHRUM HYSSOPIFOLIA L. Husbands Bosworth, Leicester. ELLIS, ex HORWOOD; †Burnley, S. Lancs, RITCHINGS, ex TRAVIS.

1049. EPILOBIUM TETRAGONUM L. Gors Llwyn, Colbren, Brecon, WEBB.

†1071. FUCHSIA RICCARTONI Hort. In a moor, among heather, Syredale, Orkney, BURDON & DRUCE. Colonel Johnston, who was with us, has since learned that it was planted there.

*1073. CIRCAEA ALPINA L. The Hudnalls, Hewelsfield, W. Gloster. *Fl. Chepstow.*

†1077. MESEMBRYANTHEMUM EDULE L. Ventnor, Isle of Wight; near Exeter, Devon, RAYNER.

†1077 (3). M. AEQUILATERALE Haw. Dawlish, Devon, D'URBAN. Det. Dr RENDLE.

†1082. ASTRANTIA MAJOR L. By the Evenlode, Oxon, POWELL.

†1088. BUPLEURUM FRUTICOSUM L. This has been long naturalised near Malvern (see *Fl. Worc.* 162). It is still there, teste Rev. F. BENNETT. About ten years ago I saw it at Slapton, S. Devon, whence Miss TODD has sent specimens this year.

1090. B. ROTUNDIFOLIUM L. Abundant near Northants, DRUCE.

1097. APIUM GRAVEOLENS L. Culross, Fife, BELL.

†1098. A. LEPTOPHYLLUM F. v. Muell. Watton station yard, W. Norfolk, ROBINSON. Det. TURRILL.

*1099. A. INUNDATUM Reichb. f. Commin-y-Rhos, Brecon, WEBB.

†1101. AMMI MAJUS L. Pyrford, Surrey, on ground manured with shoddy waste, Lady DAVY & DRUCE; Felixstowe, E. Suffolk, M. COBBE.

†1102. A. VISNAGA L. Carmarthen, HAMER.

†1103. CARUM CARVI L. Abundant and completely naturalised about the kirk of Baltasound, Unst; coast, John o' Groats, Caithness; Stromness, Orkney, DRUCE.

*1113. PIMPINELLA MAGNA Huds. Woodmills, Hants, 1852, PIQUET. Townsend rejects *P. magna* for the county although it is given for N. & S. in *Top. Bot.*

*1127. ANTHRISCUS SCANDIX Beck. Portskewett, etc., Monmouth, *Fl. Chepstow*.

†1128. A. CEREFOLIUM Hoffm. Hayling Island, Hants, Miss HILLARD; Devizes, Wilts, TALBOT.

1131. CRITHMUM MARITIMUM L. Near Landguard Fort, Felixstowe, A. B. COBBE. One locality only given in *Fl. Suffolk.*

*1134. ŒNANTHE CROCATA L. East Mersea, N. Essex, BROWN.

*1136. O. SILAIFOLIA Bieb. Cherwell Meadows, Aynhoe, Northants, abundant. Last year Mr Riddelsdell found it in the Oxon meadows at Somerton, which induced me to search higher up the valley, DRUCE.

†1152. PEUCEDANUM OSTRUTHIUM Koch. Llanelly, Carmarthen. HAMER.

†1152 (2). P. GRAVEOLENS B. & H. St Ouen's, Jersey, 1857. PIQUET.

1154. HERACLEUM SPHONDYLIUM L., var. ANGUSTIFOLIUM Huds. Commoner than the type round Llandewlrcwm, Brecon; Llanelwedd to Howey. Radnor, WEBB.

†1157. CORIANDRUM SATIVUM L. Pembrey, Carmarthen, HAMER: Kirkwall Waterworks, Orkney, DRUCE.

1172. HEDERA HELIX L., var. SARNIENSIS Druce. St Anne's, etc., Jersey; *Chichester, W. Sussex; also at Mont Saint-Michel, Brittany, DRUCE.

†1187. LONICERA XYLOSTEUM L. Clements Quarry, Mumbles, Glamorgan, WEBB.

1192. GALIUM BOREALE L. The Beacons, Brecon, TROW.

1193. G. MOLLUGO × VERUM. Minsterworth, Gloucester. GAMBIER-PARRY.

*1194. G. ERECTUM Huds. Between Rhaydder and Elan, Radnor. WEBB; Downatown, Birsay, Orkney. Named by Bennett

Bakeri. I should put it under *erectum.* Distributed this year by Preb. Burdon.

1195. G. HERCYNICUM Weig. Galled with *Eriophyes galiobius.* From the downs in Sussex, WEBSTER.

1210. ASPERULA ARVENSIS L. Near Bennington High Wood, Herts, GRAVESON.

1214. SHERARDIA ARVENSIS L., var. MARITIMA Griseb. Berry Head, S. Devon, Miss TODD. Var. HIRSUTA Baguet. Ferryside, Carmarthen, HAMER.

*1215. VALERIANA OFFICINALIS L. (MIKANII). Perddyn Glen, Brecon, WEBB.

*1216. V. SAMBUCIFOLIA Mik. Side of river at Grouville, Jersey, 1875, PIQUET.

1225. VALERIANELLA CARINATA Lois. Hayling Isle, S. Hants, Miss HILLARD; *Beaminster, Dorset, GRAVESON; Lynton, N. Devon, L. B. HALL.

1226. V. RIMOSA Bast. Barry, Glamorgan, Miss VACHELL.

†1230. DIPSACUS LACINIATUS L. Marston brickyards, Oxon, DRUCE.

†1233 (2). CEPHALARIA TATARICA Schrad. Railway-cutting, Neithrop, Oxon, DRUCE.

†1242. GRINDELIA SQUARROSA Dunal. Felixstowe Docks, E. Suffolk, M. COBBE.

†1252. ASTER NOVI-ANGLIAE L. Near Kidwelly, Llanstephan, Carmarthen, **HAMER**.

1258. A. TRIPOLIUM L., var. GLABER Bolz. Finstown, Orkney, DRUCE.

*1261. ERIGERON ACRE L. Near Caldicot, Monmouth, *Fl. Chepstow.*

†1262. E. CANADENSE L. Carmarthen, HAMER.

†*1265. FILAGO SPATHULATA Presl. Levenhall, Midlothian, FRASER.

1268. F. GALLICA L. Berechurch, October 1920, in some plenty, TRETHEWY. It is very gratifying to know that this rare species, which is often ephemeral, persists in Essex. Mr Brown distributed it this year from this locality.

†1271. ANAPHALIS MARGARITACEA Clarke. Ystradgynlais and Abercrave, Brecon, WEBB; Hamlet of Lake, near Tavistock, Devon, well established, HARRIS in *Dev. Rep.* 8, 1920. Burn of Beaguoy, Orkney, in a stream-bed, but grown in garden not far away. DRUCE.

1274. GNAPHALIUM ULIGINOSUM L., *var. PILULARE (Wahl.) Koch. Mullion, Cornwall, Miss TODD.

*1275. G. SYLVATICUM L. Llanwrthwl, Brecon, WEBB. *Var. ALPESTRE Gren. Tingwall, Shetland. This is the *norvegicum* of Edmondston's *Flora of Shetland.*

†1278. G. UNDULATUM L. Spreading rapidly over the sandy soils in Jersey, seeding freely, DRUCE.

†1291. AMBROSIA ARTEMISIFOLIA L. Thetford, W. Suffolk, M. COBBE; St Ouen's Bay, Jersey, 1906, PIQUET; Silloth, Cumberland, WATERFALL.

1292. A. TRIFIDA L. Thetford, W. Suffolk, M. COBBE; Docks Lisiand, Cheshire, WATERFALL.

†1294. XANTHIUM STRUMARIUM L. Felixstowe, E. Suffolk, M. COBBE (one locality only in *Fl. Suffolk*); St Peter's Valley, Jersey, 1896, PIQUET.

†1295. X. SPINOSUM L. Felixstowe, E. Suffolk, M. COBBE; St Ouen's Bay, Jersey, PIQUET.

†1301. HELIANTHUS ANNUUS L. Chigwell, S. Essex, REDGROVE.

†1302. H. RIGIDUS Desf. Denham, Bucks, REDGROVE.

†1306. GUIZOTIA ABYSSINICA Cass. Salisbury, Wilts, GODDARD; Pyrford, Surrey, Lady DAVY; Reading, Berks, MURRAY.

†1311 (2). BIDENS PILOSA L. Bristol, Mrs SANDWITH.

†1312. GALINSOGA PARVIFLORA Cav. Handcross, Sussex, Mrs GRAHAM.

†1315. HEMIZONIA PUNGENS T. & G. Dovecourt, Essex; Felixstowe, E. Sussex, A. B. COBBE; Hertford, GRAVESON; Silloth, Cumberland, WATERFALL.

1329. ACHILLEA MILLEFOLIUM L., var. CONSPICUA Druce. Twinstead, N. Essex, DRUCE.

†1332 (2). A. FILIPENDULINA Lam. (EUPATORIUM Willd.). On the railway at Neithrop, Oxon, 1920, DRUCE.

†1336. SANTOLINA CHAMAECYPARISSUS L. Ferryside, Carmarthen, HAMER.

*1343. ANTHEMIS ARVENSIS L. Lindors Farm, Monmouth. *Fl. Chepstow.* Piquet's "*arvensis*" from Samares, Jersey, is only *A. Cotula.*

†1344. A. RUTHENICA Bieb. Cornfields, Jersey, 1900, as *arvensis*. PIQUET.

†1352. CHRYSANTHEMUM MYCONIS L. Leith, Midlothian, FRASER & GRIERSON.

1353. C. LEUCANTHEMUM L., with tubular ligules. Bewdley, Worcester, 1854, GISSING; Alveston, W. Gloster, Miss ROPER.

1356 (5). C. LACUSTRE Brot. Alien. Hortal. Langland, Glamorgan, WEBB.

1360. MATRICARIA INODORA L., var. flore pleno. Maisemore, Gloster, GAMBIER-PARRY. A frequent garden plant in the Orkneys. Var. SALINA Bab. Carmarthen, HAMER.

*1361. M. CHAMOMILLA L. Chepstow, W. Gloster, *Fl. Chepstow.*

†1362. M. SUAVEOLENS Buch. Near the lighthouse under Hermaness, the most northern point of the British Isles. DRUCE.

†1363 (2). M. DISCIFORMIS DC. Bristol, Mrs SANDWITH.

1370. ARTEMISIA SCOPARIA W. & K. Crosby, Lancs, 1895, Rev. W. W. MASON.

1373. A. VULGARIS L., var. COARCTATA Fors. Ferryside, Carmarthen, HAMER; St Brelade's, Jersey, PIQUET.

†1380. A. BIENNIS Willd. Thetford, Caistor-on-Sea, W. and E. Norfolk, M. COBBE; Ferryside, Carmarthen, HAMER.

†1388. DORONICUM PARDALIANCHES L. Frequent at Disserth, Radnor, WEBB.

1395. SENECIO ERUCIFOLIUS L. To a glabrous form of this Dr Thellung refers the "*S. crassifolius* from Walmer" collected by Miss DAY, in 1907.

†1396. S. SQUALIDUS L. Carmarthen, HAMER.

†1402. S. CINERARIA DC. Caswell, Glamorgan, WEBB.

†1408 (24). S. SMITHII DC. (CINERARIA GIGANTEUS Sm. Eng. Bot. ii., 2, t. 65). In a ditch between John o' Groats and Castleton, Caithness, 1919 and 1920, Mrs WEDGWOOD & DRUCE. Det. THELLUNG.

†1412. ECHINOPS SPHAEROCEPHALUS L. Neithrop, Marston brick-yards, Oxon, 1920, DRUCE; near Carmarthen, HAMER; Fort Regent, Jersey, 1903, PIQUET.

*1415. CARLINA VULGARIS L. Colbrennan tips, Radnor, WEBB.

*1431. CIRSIUM TUBEROSUM All. On the chalk near Eversden, Cambridge, A. H. EVANS. A remarkable and most interesting extension of its range. One of the best finds of the year.

†*1432. C. OLERACEUM Scop. St Peter's Valley, Jersey, 1861, PIQUET.

†1433. C. ARVENSE Scop., var. MITE M. & K. Dovercourt, Essex, A. B. COBBE. Var. INCANUM Ledeb. (of SETOSUM). By the Aire, Shipley, Yorks, A. M. SMITH.

1434. C. PALUSTRE Scop., *var. FEROX Druce. Baltasound, Unst, Tingwall, Ronas Voe, Sandwick, etc., Shetland; Birsay, Hoy, etc., Orkney, DRUCE.

*1439. ONOPORDON ACANTHIUM L. Tintern Road, Monmouth, *Fl. Chepstow*.

1449. CENTAUREA JACEA L. In De Crespigny's old locality near Kingswood, Surrey, 1920, REDGROVE. Var. ANGUSTIFOLIA (Gugler). Don Bridge, PIQUET; Val des Vaux, Jersey, Dr BULL, as *nigra*; Wellington College, Berks, BRITTON.

†1450. C. NIGRESCENS Willd. Goring, Oxford, 1917, GAMBIER-PARRY.

1451. C. NEMORALIS Jord., teste Britton. St Albans, Herts; Hopcroft's Holt, Oxon; Grendon, Bucks; Selham, Sussex; Boar's Hill, Berks; Pan Downs, Isle of Wight, DRUCE; St Saviour's, Jersey, PIQUET; S. Tawton, Devon, FOX. Forma RADIATA. Carisbrooke, Isle of Wight; Boar's Hill, Berks; Binsey, Oxon; St Albans, Herts; Grendon Meadows, Bucks; Brackley, Northants, DRUCE.

1451. C. CONSIMILIS Jord. West Horsley, Surrey [1766], BRITTON.

1451. C. MICROPTILON Gren., forma. Wood Perry Wood, Oxon, DRUCE; Banstead and Epsom Downs [2 and 86], Surrey, BRITTON.

1452. C. NEMOPHILA Jord. Lower Morden, Surrey [2040], BRITTON.

1454. C. CYANUS L. Dinham, etc., Monmouth, *Fl. Chepstow*.

1462. C. SOLSTITIALIS L. In great abundance at Felixstowe, E. Suffolk, M. COBBE.

1463. C. MELITENSIS L. Felixstowe, E. Suffolk, M. COBBE; Colchester, BROWN.

1494. CREPIS BIENNIS L. Newport, Countess Wear, S. Devon, D'URBAN; field near Askham Bog, York, GRAVESON.

†1495. C. NICAEENSIS Balb. By the water-works, Kirkwall, Orkney. Shown us by Col. Johnston. It has persisted for many years.

*1559. HIERACIUM PROXIMUM F. J. H. Keswick, Cumberland, PUGSLEY, in *Journ. Bot.* 282, 1920.

*1591. H. FARRENSE F. J. H. Hesleden Glen, W. Yorks, PUGSLEY, in *Journ. Bot.* 285, 1920.

*1608. H. IRRIGUUM Fr., var. SCANICUM (Dahlst.), teste PUGSLEY, *l.c.* Saintfield, Co. Down. Named in the *Wats. B.E.C.* 16. 1902-3, *diaphanoides*. This I gathered near Dublin in 1907.

1641. HYPOCHOERIS GLABRA L. Frequent at St Brelade's, etc., Jersey, with a form worth further study, DRUCE. Miss A. B. COBBE found at Thetford Camp, W. Suffolk, a similar plant to the large form referred to in *Rep. B.E.C.* 288, 1918.

1646. TARAXACUM SPECTABILE Dahlst. Common in Orkney and Shetland, DRUCE.

*1646. T. GEIRHILDAE Beeby. I put this as a var. of *T. spectabile* Dahlst. Stromness, Orkney. I found it in the locus classicus by the Loch of Girlstone, Shetland, DRUCE.

1646. T. NORDSTEDTIANUM Dahlst. Chichester, W. Sussex, DRUCE.

†*1647. CHONDRILLA JUNCEA L. St Ouen's Bay, Jersey, 1905, PIQUET.

†*1648. LACTUCA VIROSA L. Near Severn Tunnel Junction, Monmouth, *Fl. Chepstow*.

†1653. L. TATARICA C. A. Mey. Docks, Felixstowe, E. Suffolk, M. COBBE.

1655. SONCHUS PALUSTRIS L. Near the Waveney, E. Suffolk, 1920, GRAVESON. It was in some quantity and in good condition. This very important re-discovery leads one to hope that the Fen Ragworts may yet be found to exist.

1656. S. ARVENSIS L., var. GLABRESCENS G. G. & W. East Mersea, N. Essex, BROWN.

1657. S. ASPER Hill, var. PUNGENS Bisch. Wytham, Berks. Distributed this year. Neithrop, Botley, Oxon; Thame, Bucks; Wilsford, Wilts; St Neot's, Hunts; Southam, Warwick; Aynhoe, Northants, DRUCE. Var. INTEGRIFOLIUS Wallr. St Helier, Jersey; Chichester, W. Sussex; Cardiff, Glamorgan; St Neot's, Hunts; Croughton, Peterborough, Northants; Chatteris, Madingley, Cambridge; Twinstead, N. Essex; Sudbury, Suffolk; near Aylesbury, Bucks; Wilsford, Wilts; Southam, Warwick; Lichfield, Staffs; Lochearnhead, Perth; Inverness; Wick, Caithness; Kirkwall, Orkney; Scalloway, Unst, Shetland, DRUCE.

1658. S. OLERACEUS L., var. TRIANGULARIS Dum. Newport, Countess Wear, S. Devon, D'URBAN; Wilsford, Wilts; Croughton, Northants; Oxford; near Woburn, Beds; St Neot's, Hunts; Lichfield, Staffs, DRUCE. Var. LACERUS Willd. Crabbe, St Brelade's, Jersey; Petit Bot, Guernsey; near Yarmouth, Isle of Wight; Chichester, W. Suffolk; Aynhoe, Northants, DRUCE. It is probable that these varieties are elementary species.

†1661. TRAGOPOGON CROCIFOLIUS L. Bulwark, Chepstow, Monmouth, the ground now built over, Capt. FRASER, in *Fl. Chepstow*.

1664. LOBELIA DORTMANNA L. This is the "*Isoetes*" from

Lough Magillie, Wigtown, 1883, C. BAILEY. The Quillwort is still a desideratum for this county.

*1665. L. URENS L. Native on a heath in the vicinity of Poole, Dorset, Sir H. C. HAWLEY, *in litt.* An important record for the year. Near Highcliffe, S. Hants, Mrs LUFF.

1666. JASIONE MONTANA L., var. MAJOR M. & K. L'Etac, Jersey; Saxa Vord, Unst, DRUCE.

1672. CAMPANULA LATIFOLIA L. Cheddington, Dorset, GRAVESON. Only one locality in *Fl. Dorset.*

†1674. C. RAPUNCULOIDES L. Hedge, near Thetford, West Norfolk, M. COBBE.

†1676. C. PERSICIFOLIA L. Etchilhampton Down, Wilts, one specimen, GWATKIN. It is grown in the cottage gardens of the village.

1694. ERICA CINEREA L., var. SCHIZOPETALA. Charbe Common, Lee-on-Solent, S. Hants, Miss HILLAR; Saxa Vord, Unst, DRUCE.

†1704. BORETTA CANTABRICA O. K. Henwood, Berks, Lady DOUIE. Certainly planted there.

†1706. RHODODENDRON PONTICUM L. Langland, Glamorgan, seeding freely, WEBB.

1712. HYPOPITYS MONOTROPA Crantz, var. GLABRA (Roth). On Holly near Billingshurst, Sussex, WEBSTER; Wyndcliff, Monmouth, SHOOLBRED, *in litt.* and in *Journ. Bot.* 227, 1920, where *Helleborus atroviridis* should be *Helleborine atroviridis.*

1721. STATICE PLANIFOLIA Druce. Baltasound, Unst: *Cairngorm, Easterness. As Mr Beeby pointed out, this differs from the type by flowering a fortnight or so earlier in cultivation, a somewhat remarkable character since normally it is a plant of mountain shoulders and summits and only in the north Shetlands descending to 300 feet. The type grows in Jersey as well as S. MARITIMA Mill. DRUCE.

1725. PRIMULA VULGARIS Huds., forma or sub-var. ROSEA. Found in a wood on the slope above Bury Lodge, S. Hants, by Sir T. BUTLER. It had never been noticed there previously.

†1731. CYCLAMEN HEDERIFOLIUM Ait. In woods between Pen Moel and Lancaut, near Gloster; Usk Road, near Chepstow, Monmouth. *Fl. Chepstow.*

†*1734. LYSIMACHIA PUNCTATA L. Of garden origin, but established, near Stenness, Orkney, DRUCE.

*1742. ANAGALLIS FEMINA Mill. Arthog, Merioneth, JONES.

†1750. VINCA MAJOR L. Cwmtwrch, Brecon, WEBB.

*1755. CENTAURIUM VULGARE Rafn. St Catherine's Bay, Jersey, PIQUET.

*1758. C. CAPITATUM Druce. Near Carmarthen, HAMER.

1763. GENTIANA AMARELLA L., var. CALYCINA Druce. Locally common at Burrafirth, Unst; Dunscansby Head, Caithness, DRUCE.

†1777. POLEMONIUM CAERULEUM L. Bank of river between Kimpton Hoo and Whitwell, Herts, 1847, ANSELL.

†1781. HELIOTROPIUM EUROPAEUM L. Swaythling, S. Hants, RAYNER.

†1783. OMPHALODES VERNA Moench. Panshanger Park, Herts, 1844, ANSELL. Doubtless planted.

†1787. LAPPULA ECHINATA Gilib. Newport, Countess Wear, S. Devon, D'URBAN; near Weston, Bath, N. Somerset, GREEN; Beaminster, Dorset, GRAVESON.

†1789. BENTHAMIA (AMSINCKIA) ANGUSTIFOLIA (Lehm.). Thetford, Felixstowe, W. and E. Suffolk, Miss COBBE.

†1789 (3). B. LYCOPSIOIDES Lindl. Colchester, BROWN.

†1789 (5). B. INTERMEDIA Druce. Earls Croome, Worcester, CARLETON REA; Hertford, GRAVESON.

†1789 (6). B. MENZIESII (Nelson & M'Bride). Kirtlington, Oxon, FELLOW.

†1793. SYMPHYTUM ORIENTALE L. Lane near St Helier, Jersey, 1908, as *tauricum*, PIQUET.

†1798. ANCHUSA SEMPERVIRENS L. Brecon, WEBB.

†1799. A. UNDULATA L. Thetford Camp, W. Suffolk, M. COBBE.

†1802. A. AZUREA Mill. Neithrop, Oxon, DRUCE.

†1803. A. PROCERA Bess. Thetford Camp, W. Suffolk, M. COBBE, teste THELLUNG.

1813. MYOSOTIS PALUSTRIS Hill, var. STRIGULOSA (Reichb.). Traeth Glasly, Merioneth, LLOYD WILLIAMS.

1817. M. SYLVATICA Hoffm. Plantation near Godalming, Surrey, probably planted, DRUCE; Elan Woods, Brecon, WEBB; Barton Bradstock, Dorset, GRAVESON. If native here a new county record.

*1821. M. LUTEA Pers. (BALBISIANA). St Catherine's, Jersey; Balta, Unst, from the extreme north and south of the British Isles, DRUCE.

*1825. ECHIUM VULGARE L. Tipsot, Ystradgynlais, Brecon, WEBB.

†1827. E. PLANTAGINEUM L. Field near Boxgrove, W. Sussex, one plant, F. DRUCE. Passed as correct by C. C. LACAITA.

†1830. CERINTHE MINOR L. Thetford Camp, W. Suffolk, A. B. COBBE; Welbeck, Notts, GOULDING.

1831. VOLVULUS SEPIUM Med., var. COLORATUS (Lange). Cadgwith, Cornwall, Miss TODD.

†1831. V. DAHURICUS (Sims). Marston, Oxon. DRUCE.

†1837. CUSCUTA EPILINUM DC. Twinstead, N. Essex, DRUCE.

1838. C. EUROPAEA L. Hedge, Shepperton, Middlesex, 1920, BRITTON. In the *Fl. Middlesex* it is said to have been last seen in the county in Hyde Park in 1821. Mr Hunnybun's record for this county in *Journ. Bot.* 58, 1918, is an error, as the locality he gives near Windsor is of course not in Middlesex but in Bucks where it has been known for many years.

1839. C. EPITHYMUM Murr. West side of Burrafirth, Unst, Saxby *Flora*. This needs confirmation as it is an unlikely plant to occur there. *Dyffryn, Merioneth, JONES.

†1851. PHYSALIS ALKEKENGI L. Fields at St Helier, St Ouen's, Jersey, 1901, PIQUET.

†1852. NICANDRA PHYSALOIDES Gaertn. St Ouen's, Jersey, 1906, PIQUET.

†1853. LYCIUM CHINENSE Mill. Cwmtwrch, Brecon, WEBB.

†1855. DATURA STRAMONIUM L. Thetford, W. Norfolk; Felixstowe, Aldeburgh, E. Suffolk, A. B. COBBE. Exceptionally fine.

†1860. VERBASCUM PHLOMOIDES L. Waste ground, Byfleet Park, Surrey, BRITTON.

†1863. V. VIRGATUM Stokes. Cirencester, Gloster, GREENWOOD; Bangor, Carnarvon, Mrs WEDGWOOD.

†1864. V. BLATTARIA L. St Columb Major, Cornwall: Shalford, Surrey, Mrs WEDGWOOD; Tan-y-Bwlch, Merioneth, JONES; Dudbridge, Gloster, BAILEY.

†1864 (3). V. SINUATUM L. Levenhall, Edinburgh, FRASER.

*1867. V. NIGRUM L. Tan-y-Bwlch, Merioneth, JONES.

†1873 (2). LINARIA DALMATICA Mill. Neithrop, Oxon, DRUCE.

†1877. L. PURPUREA Mill. St Vincent's Rocks, Gloster, PAGE.

†1880. L. PELISSERIANA Mill. Between Pendinas and the river Istwith, south of Aberystwith, Cardigan, JONES.

*1883. L. MINOR Desf. St Brelade's, Jersey, PIQUET.

1884. L. SPURIA Mill., var. PELORIA. Great Bedwyn, Wilts HURST.

†1889. ANTIRRHINUM MAJUS L. Brecon Castle, WEBB.

†1898. MIMULUS GUTTATUS DC. River Gynon, near Llwdcoed, Brecon; Wye, at Rhayader, Radnor, WEBB; Mailand Burn, Unst, DRUCE.

†1899. M. MOSCHATUS Dougl. Whiddon, Devon, Miss TODD; on dredged mud, Hertford, GRAVESON.

*1912. VERONICA AQUATICA Bernh. Forfarshire, 1835, REID, in *Hb. New York*; Saumares Miles, Jersey, DRUCE.

*1912 (2). V. ANAGALLIS-AQUATICA L., vera. Blanches Banques, Jersey, DRUCE.

1918. V. VERNA L. Exceptionally fine specimens were gathered by Miss M. COBBE, on Thetford Heath and Warren this spring.

†1922. V. TRIPHYLLOS L. Charlestown, Cornwall, Mrs WEDGWOOD & RILSTONE.

†1927. V. PEREGRINA L. St Saviour's, Jersey, 1876, Dr BULL.

†1930 (4). V. SPECIOSA R. Cunn. Langland, Glamorgan, WEBB; near Barmouth, Merioneth, frequently planted on the coast, DRUCE.

*1931. EUPHRASIA STRICTA Host. Pembrey, Carmarthen, HAMER.

1931. E. HIRTELLA Jord. Moretonhampstead and Manaton,

N. Devon, and E. FOULAENSIS Towns. Moretonhampstead, N. Devon, LARTER, in *Devon Rep.* 5, 1920. On whose authority these very critical plants are named is not stated.

1932. E. BOREALIS Wetts. Stenness, etc., Orkney; Baltasound, Unst, DRUCE. To this species Dr Ostenfeld and Dr Jorgensen refer some beautiful plants which are a new form to me from Hoy, Swanbister, Syredale, Orkney; Asta, Tingwall, Sandwick, Stroma, Whiteness, Lerwick, Ronas Voe, Balta, Burrafirth, and Haroldswick, Shetland, DRUCE.

1933. E. BREVIPILA Burn. & Gremli. St Lawrence, Isle of Wight, LOYDALL; Llandrindod, Radnor, Miss TODD; Moss-side, Stafford, S. A. BENNETT; Cnochan, W. Ross & W. Sutherland; Duncansby-Head, Caithness; Kirbister, Orkney; Scalloway, Baltasound, Shetland; *St Brelade's, Jersey, DRUCE.

1934. E. NEMOROSA H. Mart., var. CILIATA Drabble. Park Corner, Oxford; Princes Risborough, Bucks; Tubney, Berks; between Bethesda and Llanberris, Carnarvon; Bodeilio, Anglesey; Twinstead, N. Essex; Linton, Cambridge; Duncansby Head, Caithness, DRUCE.

1935. E. CURTA Wetts., var. GLABRESCENS Wetts. Kirbister, Orkney; Newborough, Anglesey; Castle Rock, Co. Down, DRUCE.

1936. E. OCCIDENTALIS Wetts. Harlech, Merioneth, DRUCE.

1938. E. FOULAENSIS Towns. Baltasound, Burrafirth, Stroma, Whiteness, Tingwall, etc., Shetland, DRUCE.

1939. E. GRACILIS Fr. Tyn-y-Croes, Merioneth; Grand Mare, Guernsey, DRUCE.

1940. E. SCOTICA Wetts. Braemore, W. Ross; Glen More, Easterness; Ronas Voe, Tingwall, Burrafirth, Baltasound, Saxa Vord, Shetland, DRUCE.

1940 (2). E. MINIMA Fr. Carnedd Llewellyn, Carnarvon, DRUCE.

1940 (3). E. CONFUSA Pugsl. Exmoor, S. Somerset, 1919, PUGSLEY, *in litt.*

1941. E. ROSTKOVIANA Hayne. Burrafirth, Shetland, as a very curious form, DRUCE.

1943. E. KERNERI Wetts. Twinstead, N. Essex; Swaffham, W. Norfolk; Llanberris, Carnarvon, DRUCE.

1951. PEDICULARIS SYLVATICA L., sub-var. ALBA. Exbourne, N. Devon, Rev. A. C. MORRIS.

1952. RHINANTHUS MAJOR Ehrh. Baltasound, Unst, DRUCE.

1953. R. RUSTICULUS (Stern.) Druce. *Baltasound. Plants similar to the Rev. E. S. Marshall's Stenness specimens. This starved form grew in a few places on the south side of the Loch of Stenness, as Mr Marshall describes, but it gradually merged into plants I should have been content to call *stenophyllus* or *Crista-galli*.

1954. R. STENOPHYLLUS Schur. Tidenham Chase, W. Gloster, *Fl. Chepstow*.

1955. R. MONTICOLA Druce. Glen More, Easterness, DRUCE.

1960. MELAMPYRUM PRATENSE L., var. HIANS Druce. Perdyn Glen, Brecon, WEBB. Var. LAURIFOLIUM (Beauv.). Ufton Wood, Warwick, DRUCE.

1971. OROBANCHE MINOR Sutt., *var. FLAVESCENS Reut. Near Beaminster, Dorset, GRAVESON.

1972. O. PURPUREA Jacq. Mundesley, E. Norfolk, CLARKE.

1975. UTRICULARIA VULGARIS L. *Reen, Monmouth, *Fl. Chepstow*; Bewdley, Worcester, 1899. The record in the *Flora* was not definitely from a Worcester locality.

*1976. U. MAJOR Schmid. Tingwall, Bardister, Shetland, DRUCE.

1978. U. MINOR L. Tingwall, Shetland, DRUCE.

1989. MENTHA ALOPECUROIDES Hull. Rondham, Norfolk, M. COBBE; Bishop's Stortford, Essex, BROWN; Linton, Cambridge, GRAVESON & DRUCE; Tinsley Green, Sussex, GRAVESON; St Saviour's Valley, Jersey, as *rotundifolia*, PIQUET.

1990. M. LONGIFOLIA Huds. Kilkenny, Ireland, Hon. Mrs FIENNES. Var. NEMOROSA, teste A. BENNETT. Slateford, Edinburgh, FRASER. M. LONGIFOLIA × ROTUNDIFOLIA. St Lawrence Valley, Jersey, as *alopecuroides*, PIQUET.

1994. M. AQUATICA L. Galled with *Eriophyes mentharius*. Carmarthen, HAMER.

1995. M. PUBESCENS Willd., agg. Bayford, Herts, W. GRAVESON.

1997. M. GENTILIS L. Liskeard, Cornwall; Bovey Tracey, Devon, Miss TODD; Swallowfield, Berks, Miss BACON; Wye banks, above Tintern, Monmouth and W. Gloster, *Fl. Chepstow*.

*2012. SATUREIA NEPETA Scheele. Netley, S. Hants, 1852, PIQUET.

†2023. SALVIA PRATENSIS L. Near Guildford, Surrey, 1847, ANSELL.

†2025. S. NEMOROSA L. Thetford, W. Suffolk, M. COBBE.

*2034. NEPETA CATARIA L. Near L'Etac, Jersey, 1855, PIQUET.

2042. SCUTELLARIA GALERICULATA L., var. PUBESCENS Benth. Laugharne, Carmarthen, HAMER.

2044. PRUNELLA VULGARIS L., var. NEMORALIS Beg. Carmarthen, HAMER.

*2046. P. LACINIATA L. On the downs near Herne Bay, E. Kent, W. R. SHERRIN.

†2048. SIDERITIS MONTANA L. Felixstowe Docks, E. Suffolk, M. COBBE.

2056. STACHYS SYLVATICA L., f. MONSTROSA. The corolla tube not exerted, the perfect flowers green, with reddish margins, leaves yellowish-green, with red markings. Tickenham, etc., N. Somerset, and near Caldicot, Monmouth, CECIL & NOEL SANDWITH.

2056. × S. AMBIGUA Sm. Mosterton, Dorset, GRAVESON. In Shetland frequently as a garden plant and usually without *sylvatica* near.

*2061. GALEOPSIS VERSICOLOR Mill. Peat moor, and in cultivated ground near Glastonbury, N. Somerset, Mrs SANDWITH.

*2072. LAMIUM HYBRIDUM Vill. Sedbury, W. Gloster, *Fl. Chepstow*.

2077. BALLOTA NIGRA L. Abundant, with white flowers, at Bawdsey Ferry, Suffolk, A. B. COBBE. It is a pretty, small-leaved form of *albiflora* which seems a distinct variety.

*2077. B. RUDERALIS Sw. Thetford, W. Suffolk, M. COBBE; Portishead, N. Somerset, an abnormal form with less attenuate calyx-teeth, Mrs SANDWITH.

*2091. PLANTAGO HUDSONIANA Druce. Ledmore, W. Ross, DRUCE.

2092. P. LANCEOLATA L. A curious monstrosity in which the inflorescence is almost replaced by long leafy bracts, Mangrove Lane, Hertford, 1847, ANSELL. *Var. DEPRESSA. Burrafirth, Shetland, DRUCE.

*2098. P. MEDIA L. St Ouen's Bay, Jersey, 1854, PIQUET. Babington recorded it as common, but there is no record in the *Flora of Jersey*. Perhaps this is an alien specimen.

2099. P. MAJOR L., var. INTERMEDIA (Gil.). Near Wymondham, Norfolk, Mrs RUSSURIM.

*2102. ILLECEBRUM VERTICILLATUM L. New Forest, S. Hants, RAYNER; in great quantity near Doves, Kent, Mrs GODDEN. These two important discoveries extending the range from Cornwall to Kent, are among the best of the year. The question arises—have they been previously overlooked, or are they comparatively recent arrivals? With regard to the latter record, Mrs Godden pertinently suggests that the locality given in the *Flora of Kent* of four miles S.W. of Dover may be a misreading for Doves, Kent, as the locality is just about four miles from that place. If so, the plant has a longer history in Kent.

†2105. HERNIARIA HIRSUTA L. Charleston, Cornwall, RILSTONE & Mrs WEDGWOOD.

2109. SCLERANTHUS ANNUUS L., var. HIBERNUS Reichb. Newquay Cornwall, VIGURS.

2110. AMARANTHUS RETROFLEXUS L., var. DELILEI (Richt. & Lor.) Thell. St Saviour's Valley; old quarry, St Peter's Valley, Jersey, PIQUET.

†2113 (2). A. THUNBERGII Moq. Thetford, W. Suffolk, A. B. COBBE.

2114 (3). A. SILVESTER Vill. (A. ANGUSTIFOLIUS). Waste places, St Helier, Jersey, PIQUET.

2120. CHENOPODIUM HYBRIDUM L. Hayling, S. Hants, Miss HILLARD; *Kirkwall, Orkney, DRUCE & JOHNSTON.

2122. C. MURALE L. Pembrey, Carmarthen, HAMAR. Var. MICROPHYLLUM Boiss. Felixstowe, E. Suffolk, A. B. COBBE; Glasgow, GRIERSON.

†2123. C. OPULIFOLIUM Schrad. Rainham, Essex, L. B. HALL.

2124. C. ALBUM L., var. VIRIDESCENS St Amans. Wellingborough, Northants; St Philip's, Bristol; Drayton, Middlesex; Cardiff, Glamorgan, DRUCE. Var. VIVAX Sonder (cf. Murr *Bot. Mag. Cap.* 9, 1903). Falmouth, Cornwall, 1917, M. COBBE. Var. VIRIDE

(L.). Beaumaris, Anglesey; Byfleet, Surrey; Dundee, Forfar, DRUCE. Var. EROSUM. Marston, Oxford, DRUCE. Var. OBTUSATUM Gaud. Stockleigh Pomeroy, S. Devon, *Hb. Druce.* Var. PEDUNCULARE (Pers.). Pyrford, Surrey, DRUCE. Var. SERRATIFOLIUM Murr. Water Eaton, Bucks, REDGROVE. Var. PAUCIDENS (Murr). Thames Ditton, 1868, WATSON; Woking, Surrey, DRUCE; Galashiels, Selkirk, Miss HAYWARD. Var. SUBFICIFOLIUM (Murr). Thames Ditton, 1868, WATSON; Pyrford, Surrey, 1915, DRUCE; Walton, S. Lancs, WHELDON; Sibford, Oxon, DRUCE. Watson says he raised his plants from seeds of wild *candicans.* They may have been crossed, however. Also from Heronry, Birch, Essex [Ref. No. 1623], BROWN. This is intermediate with the type. Var. SUBOPULIFOLIUM (Murr). Radwinter, N. Essex, 1898, DRUCE; Galashiels, Selkirk, Miss HAYWARD.

†2124 (3). C. BERNBURGENSE (Zschacke). Falmouth, Cornwall, 1917, RILSTONE; Little Herkesely, Essex [Ref. No. 976], 1916, BROWN.

2124 (5). C. LANCEOLATUM Muhl. Alresford, N. Essex [Ref. No. 218], BROWN; Pyrford, Surrey; Cardiff, Glamorgan, 1916, DRUCE; Prescott, Lancs [× 454], TRAVIS; Bradford, York, as *alba × striatum*, CRYER; Selkirk, DRUCE.

*2124 (7). C. LANCEOLATIFORME Murr. Botley, Oxon, DRUCE; Galashiels, Selkirk, Miss HAYWARD.

†2125. C. LEPTOPHYLLUM Nutt. Aldeburgh, Felixstowe, E. Suffolk, A. B. COBBE.

2126. C. FICIFOLIUM Sm. Bradford, York, CRYER; Mathern, etc., Monmouth, *Fl. Chepstow.*

2127. C. GLAUCUM L. Degenham, Essex, L. B. HALL; *garden ground, St Helier, Jersey, 1909, PIQUET.

†2131 (2). C. HIRCINUM Schrad., var. SUBTRILOBUM Issl. Felixstowe, E. Suffolk, A. B. COBBE.

*2131 (4). C. BERLANDIERI Moq. Pyrford, Surrey, 1915, DRUCE; Billingshurst, W. Sussex (as *opulifolium*, var. *betulifolium*), 1917, WEBSTER; Botley, Oxon, 1916, DRUCE. Forma nova HASTATUM Murr. Billingshurst, W. Sussex, WEBSTER.

†2131 (12). C. AURICOMIFORME Murr & Thell. Bradford, York, CRYER. This was thought by Dr Thellung to come under *paniculatum*, but Murr refers it to this species.

†2134. C. VIRGATUM Ambrosi. Thetford Warren, E. Suffolk, plentiful, A. B. COBBE.

2139. SPINACIA OLERACEA L., var. SPINOSA. Glasgow, GRIERSON.

2144. ATRIPLEX PATULA L., var. BRACTEATA Westerl. Alphamstone, N. Essex, BROWN; Cardiff, Glamorgan; Pyrford, Surrey, DRUCE.

2146. A. CALOTHECA Fr. Caithness coast, LILLIE, ex BENNETT, in *Journ. Bot.*, is an error. Not true *calotheca*, Mr Bennett tells me.

2147. A. HASTATA L., var. OPPOSITIFOLIA Moq. Walton on the Naze, S. Essex, BROWN. Var. MICROTHECA Rafn. Hitchin, Herts, LITTLEBURY.

2148. A. DELTOIDEA Bab. Little Buddow, S. Essex; Beaumont cum Moze, N. Essex, BROWN; Pembrey, Carmarthen, HAMER.

†2153 (10). AXYRIS AMARANTOIDES L. Thetford, W. Suffolk, A. B. COBBE.

2168. SALSOLA KALI L., var. TENUIFOLIA Reichb. Thetford Camp, W. Suffolk, M. COBBE, teste THELLUNG, the same as my Southwick, Sussex, plant.

†2170. POLYGONUM CONVOLVULUS L. Kirkwall, Orkney, DRUCE.

2176. P. TOMENTOSUM Schrank. (MACULATUM). Leith, Midlothian, FRASER.

*2182. P. Raii Bab. St Aubin's, Jersey, Druce; Carmarthen, Hamer.

2184. P. aviculare L., var. rurivagum (Jord.). = angustifolium Gray which preserves the older trivial. Slapton, Devon, Druce; Saintfield, Co. Down, Waddell.

2184. P. heterophyllum Lindm. Rozel, Jersey; Kirkwall, Orkney; Scalloway, Balta, Shetland, Druce.

*2184 (2). P. calcatum Lindm. Bradford, York, Cryer. Reduced to a sub-species by Dr Thellung.

†2191. P cuspidatum S. & Z. Cwymtrych Cwmtwrch, Carmarthen, Webb; Crawley, Sussex, Graveson.

†2191 (2). P. sachalinense Schmidt. Wye side, Chepstow, Monmouth, Shoolbred, *in litt.*

*2195. Rumex Hydrolapatheum Huds. Exeter Canal, Devon, D'Urban; between Mathern and St Pilore, Monmouth, *Fl. Chepstow.*

2196. × R. conspersus Hartm. Hitchin, Herts, Little, adventive. The plant needs further study. A closely allied plant occurs in Essex.

†2201. R. sanguineus L. Near cottages, Mounton, Monmouth, *Fl. Chepstow.*

*2205. R. pulcher L. Castle Dell, Monmouth, *Fl. Chepstow.*

2206. R. limosus Thuill. Blackheath, Kent, Miss G. Bacon; Rondham, Norfolk, M. Cobbe.

†2210 (3). R. dentatus L. Glasgow, Grierson. Det. Turrill.

†2210 (4). R. salicifolius Weinm. Hertford, Graveson; Glasgow, Grierson.

†2229. Euphorbia Esula L. Dagenham, Essex, L. B. Hall.

†*2229 (2). E. virgata W. & K. Left bank of Tyne, Haddington, 1913. Fraser. In Balfour's *Flora of Edinburgh*, 1863, *E. Esula* is mentioned for Haddington. This, too, may be *virgata*. Caversham, Oxon, Murray; Melksham, Wilts, T. H. Green; Woldingham, Epsom Downs, Surrey, Britton.

†2237. E. Lathyrus L. Felixstowe, E. Suffolk, abundant, A. B. Cobbe; *native in wood, Great Dinham, Monmouth. *Fl. Chepstow.*

2243. Mercurialis annua L., var. ambigua (L.). St Aubin's, Jersey, Druce.

2246 (2). Ulmus Plotii Druce. Wardington, Oxon; near Southam, Warwick; Morgans Walk, Hertford, 1847. Ansell.

*2254. Myrica Gale L. Cwmddsudwr Hilld, Brecon. Webb.

*2262. Quercus sessiliflora Salisb. Jersey, probably planted, Druce.

†2265 (2). Juglans regia L. Seedlings, ? bird-sown, Royston, and springs, Hitchin, Herts, Little.

*2271. Salix purpurea L. Portskewett, Monmouth, *Fl. Chepstow.* × S. rubra Huds. *River bank between Brockweir and Bigsweir, Monmouth, *Fl. Chepstow.*

2276. S. aurita × caprea = S. capreola Kern. Twinstead, N. Essex, Druce.

2296. Ceratophyllum submersum L. St Osyth, N. Essex, Brown.

*2299. Hydrocharis Morsus-ranae L. St Brelade's, Jersey, 1911, Attenborough.

*2303. Corallorrhiza trifida Chât. In a damp wood near Braithwaite, Cumberland, Postgate, ex Stansfield.

2306. Listera cordata Br. See *Rep. B.E.C.* 680, 1918. The locality, Maentwrog, Merioneth, JONES, belongs to this species, not *Neottia*, an error in transcribing.

2313. CEPHALANTHERA DAMASONIUM Druce. Highnam, W. Gloster, GAMBIER-PARRY.

2314. C. LONGIFOLIA Fritsch. Arthog, WILLIAMS; above Harlech, Merioneth, JONES.

2315. HELLEBORINE PALUSTRIS Schrank. Eight miles beyond Sidmouth, S. Devon, Rev. Dr WAY.

2316. H. LATIFOLIA Druce. Near Buchanan Castle, Stirling, Hon. Mrs BARING; Dolgelley, Merioneth, JONES.

2318. H. PURPURATA Druce. Campden Wood, Gloster, Earl of GAINSBOROUGH & HORWOOD.

2326. ORCHIS INCARNATA L., var. DUNENSIS Druce. Llangenneth Burrows, Gower, Glamorgan, L. G. PAYNE; Braunton Burrows, N. Devon, MORRIS. Piquet's Jersey plant is *O. praetermissa* and his *latifolia* from Port Marquet is probably a hybrid of *praetermissa* with *maculata*.

2326 (2). O. PRAETERMISSA Druce. Selham, Sussex, BURDON, DRUCE & LACAITA; Chard, N. Somerset, Miss TODD; Whittington, Gloucester, CARLETON REA; Sherwood, Newton St Cyres, S. Devon, D'URBAN.

2327. O. MACULATA L., var. MACROGLOSSA Druce. Middlewick, Colchester, BROWN.

2327 (2). O. FUCHSII Druce. Selham, Sussex; Wytham, Berks, DRUCE; Bleak Hill, Woodbury Common, S. Devon, D'URBAN. Large specimens, which are often mis-labelled *latifolia*, have been sent to the Club this year. ALBAN VOIGT sends a red-flowered form from the Canton Ticino, Switzerland.

2331. O. HIRCINA Crantz. Several plants on the Quenvais in Mr Attenborough's locality; one plant near Goodwood, Sussex; *a solitary specimen in a field about two miles from Headington, Oxon, July 1920, T. J. WALL. Mr H. Balfour has cultivated *hircina* for the past 12 years at Headington from tubers brought from France. One year a specimen was over a yard high. I conjecture that the seeds may have blown to Headington—a favourable locality. This may also be the explanation of the other sporadic occurrences in England.

2334. OPHRYS SPHEGODES Mill. Near Stanton St John, Oxon, CHAMPION. It was found there about a century ago. On the Quenvais, Jersey, DRUCE.

2335. O. TROLLII Heg. Near Hardwicke, Oxon, Lady ROSE.

*2338. HABENARIA GYMNADENIA Druce (CONOPSEA). Hoyle's Wood, Pembroke, ARNETT.

2339. H. ALBIDA Br. Arthog, Merioneth, WILLIAMS; Harlech, Merioneth, JONES; south side of Ballybory Lough, Louth, BRUNKER, in *Irish Nat.* 98, 1919.

2340. H. VIRIDIS Br., var. BRACTEATA A. Gray. Brickendon, Herts, 1847, ANSELL; Barpham Downs, W. Sussex, BURDON. *Var. OVATA Druce. Baltasound, Unst, Shetland; Standing Stones of Stenness, Orkney, DRUCE.

2343. H. BIFOLIA Br., var. vel lusus ECALCARATA Druce. Perridge, near Exeter, Rev. Dr WAY.

†2355. CROCUS VERNUS Mill. (AUREUS). Frithville, Lincoln, REDGROVE.

†2360. SISYRINCHIUM ANGUSTIFOLIUM Mill. Portmadoc Docks, Carnarvon, ex JONES; Hamworthy, Dorset, GODDARD, *in litt.*

†2361 (2). S. CHILENSE Hook. A solitary specimen at Thetford, W. Suffolk, A. B. COBBE.

†2372. NARCISSUS BIFLORUS Curt. St Peter's Parish, Jersey, DRUCE.

2382. RUSCUS ACULEATUS L. Harlech, Merioneth, adventive, JONES; *between the Cwm and Bicca Common, Monmouth, *Fl. Chepstow.*

2385. POLYGONATUM MULTIFLORUM All. Wood near Box Hill, Surrey, L. G. PAYNE.

†2386. P. ODORATUM Druce (OFFICINALE). Panshanger Park, Herts, 1847, scarcely wild, ANSELL.

†2390. ASPHODELUS FISTULOSUS L. Waste ground, St Leonard's Sussex, Rev. A. G. GREGOR.

†2399. ALLIUM ROSEUM L. Near Bosahan, St Martin's, Cornwall, Miss VIVIAN.

†2401. A. TRIQUETRUM L. Dartmouth, S. Devon, MILNE.

2403. A. OLERACEUM L. Whempstead, Herts, GRAVESON.

2409. SCILLA VERNA Huds. Abundant at Balta, Unst, DRUCE. With white flowers at Merthyr Mawr, Glamorgan, WEBB = sub-var. ALBIFLORA.

2411. S. HISPANICA Mill. Meadow near Beaminster, Dorset, GRAVESON; said to grow between Perranporth and Truro, Cornwall; Watford, Herts; Northolt, Middlesex, BRITTON, in *Journ. Bot.* 227, 1920.

2416. LILIUM MARTAGON L. In woods on both sides of the Wye Valley, *Monmouth, *Fl. Chepstow.*

2420. GAGEA LUTEA Ker-Gawl. Abundant in a new locality near Beckley, Oxon, DRUCE; near Croxden, Staffs, E. DEACON.

2429. JUNCUS EFFUSUS L., var. SPIRALIS McNab. Ronas Voe, Shetland; Stromness, Orkney, DRUCE.

2437. J. BULBOSUS L., var. KOCHII (Schultz) Druce; Selham, Sussex, DRUCE.

†2441. J. tenuis Willd. Sandhills, Caistor-on-Sea, E. Norfolk, M. Cobbe.

2442. J. bufonius L., near var. giganteus A. & G. Newport, Countess Wear, S. Devon, D'Urban.

*2452. Juncoides pilosa Morong ? × Borreri (Bromf.). Piddleswood, Sturminster Newton, Dorset, with *Forsteri*, Graveson.

2453. J. Forsteri Druce. St Aubin's, Jersey, Druce.

*2477. Echinodorus Ranunculoides Engelm. Aberlady, Haddington, Bell, in *Hb. Druce*.

*2479. Sagittaria sagittifolia L. Reens, Monmouth, *Fl. Chepstow*.

*2489. Potamogeton alpinus Balb. × gramineus = P. nericus Hagstr. River Don, at Alford, N. Aberdeen, 1919, Druce & Mrs Wedgwood. S

2493. P. gramineus L., *var. lacustris Fr. Tingwall, Shetland, Druce.

2495. P. nitens Web. Bardister Loch, Tingwall, Shetland, Druce. *Var. subintermedius Hagstr. Stenness, Orkney, Druce.

2498. P. lucens L., *f. ovatifolius M. & K. Teviot, below Roxburgh, Matthews; Clattercut, Oxford, 1885, Druce.

2501. P. praelongus Wulf. Bardister, Asta, Tingwall, Shetland, Druce.

2502. P. perfoliatus L., var. Richardsonii. See *Journ. Bot.* 25, 1889. This is an error as *Richardsonii* does not occur in Europe. The plant is var. gracilis Ch. & Schl., f. lanceolatus, teste Hagström. *Var. ovatifolius Wallr. Stream, west side of Kew Gardens, Surrey; Odiham, N. Hants; River Bann and Lough Maglo, Antrim; Killarney, Kerry; Loch Leven, Kinross, etc., Druce.

*2503. P. CRISPUS × MUCRONATUS = × P. LINTONI Fryer. In considerable quantity in the canal near Lichfield, Stafford, growing with small numbers of *P. crispus* and *P. mucronatus* (*Friesii*), but of a different facies from the Chesterfield plant. It is rather remarkable that the two localities for the hybrid should be in canals with a large quantity of suspended matter in the water and frequently disturbed by canal-boat traffic. Can the resisting power against foreign pollen be reduced in these conditions? The cross once made seems to have, as in other species, great vegetative luxuriance so that individually in this area they number twenty to one of the parents. Sir ROGER CURTIS was with me when it was observed, DRUCE.

2508. P. PUSILLUS L. Bardister, Asta, Tingwall, Shetland, DRUCE. * P. FRANCONICUS Fisch. = P. PUSILLUS × TRICHOIDES. Marsden, W. Kent, as *Berchtoldi*, MARSHALL; therefore *Berchtoldi* may be deleted from the British List. Bressingdon, E. Suffolk, 1883; Mason's Drain, Peterborough, Northants, 1909; Marsh Gibbon, Bucks, DRUCE; Whitewater, N. Hants, Miss PALMER.

2508 (2). P. PANORMITANUS Biv. *Hedgecourt Mill Pond, Surrey, Mrs WEDGWOOD. Var. MINOR Hagstr. Southill Park, Beds, LITTLE; *Kirbister Loch, Orkney, DRUCE. Johnston's plant, named *pusillus*, is this also. *P. TRINERVIUS Fisch. = P. PANORMITANUS × TRICHOIDES. Pond, near Aberarth, Cardigan [2278], MARSHALL; *Swainsthorpe, Norfolk, DRUCE. *P. DUALIS Hagstr. = P. PANORMITANUS × PUSILLUS. Wytham, Berks, DRUCE. My specimen from Wolverton, E. Norfolk, 1884, was the first correctly identified as *panormitanus* in Britain. I compared it with Italian specimens.

*2508 (3). P. RUTILUS Wolfg. Bardister, Tingwall, Asta Lochs, Shetland, DRUCE. New to Scotland, unless indeed Bennett's *P. pusillus*, var. *rigidus* is the same thing.

*2508 (4). P. STURROCKII Benn. Canal near Stroud, Gloster, 1900, DRUCE. Hagström considers this to be *obtusifolius* × *panormitanus*.

*2517. ZANNICHELLIA PALUSTRIS L. Near Tuthill, W. Gloster, *Fl. Chepstow.*

*2517. Z. REPENS Boenn. To this Dr Ostenfeld refers my specimen from Swanbister, Orkney, a locality whence Dr Boswell Syme distributed *Z. polycarpa*, var. *tenuissima* Fr., DRUCE.

*2518. Z. MARITIMA Nolte. Beachley, W. Gloster, *Fl. Chepstow.*

*2518 (2). Z. GIBBEROSA. St Briavel's, W. Gloster, *Hb. Bailey.*

†2527 (3). CYPERUS DECLINATUS Moench. Bradford, 1919, CRYER.

2529. ELEOCHARIS UNIGLUMIS Schultes. Swansea Bay, Glamorgan, RIDDELSDELL, in *Journ. Bot.* 113, 1920.

2530. E. MULTICAULIS Sm. A viviparous form, side of Coniston, Lake Lancs, 1919, PEARSALL; *Carmarthen Van, Brecon, WEBB.

*2531. E. ACICULARIS Br. Bouley Bay, Jersey, 1851, PIQUET. This confirms La Gasca's record.

*2535. SCIRPUS TABERNAEMONTANI Gmel. Roggiett, Monmouth, *Fl. Chepstow*; near Worcester, 1854, GISSING.

2539. S. PAUCIFLORUS Lightf. Above Dolphinton, Peebles, 1919, TEMPLEMAN; plentiful at Baltasound, Unst, DRUCE.

2542. S. SETACEUS L. At Woking, Surrey, with Lady Davy, in 1918, a form was noticed in which the spikelets were pedicellate, but it is, as Dr Ostenfeld thinks, only an old state, the bracts and nuts having dropped, DRUCE.

2544. S. FLUITANS L. In the moat of the Standing Stones, Stenness, Orkney, DRUCE.

2546. S. RUFUS Schrad. Waulkmill Bay, Orkney, with the so-called variety, BIFOLIUS, DRUCE.

*2547. ERIOPHORUM PANICULATUM Druce. Llandrindod, Radnor, Miss TODD. Earliest evidence for Worcester, Wyre Forest, 1854, GISSING.

2553. RYNCHOSPORA ALBA Vahl, forma SORDIDA. Coniston, Lake Lancs, PEARSALL.

2556. CLADIUM MARISCUS Br. Rudley, S. Hants, the third locality in Hants, Miss BUTLER and DRUCE; Glamorgan, WEBB. In 1846 a fenman, John Denton, writing to Mr George Wolsey, said he ought to have 5s for what he sent, although no large quantity. He goes on to say that if he receives nothing he will not mind but gives as a reason for his making the request that the Cladium and Sedges at one time so abounded that they were regularly mown as a crop, bound into sheaves, and sold in Bambridge for lighting fires and sold elsewhere in the county for thatching rough timber buildings. The trade in them was great. They were also used for heating ovens in villages. . . . The result of this and draining much diminished the *Cladium* so that instead of going out and gathering an armful in an hour or two . . . it took a six mile walk to obtain the specimens sent. The farm folk call the Cladium, Mother Sedge. The plants came from Waterbeech, Cambridge, *Hb. Ansell.*

*2559. CAREX RIPARIA Curtis. Gors Llwyn, Brecon, WEBB; Llynfelin, Cardigan, DRUCE.

2560. C. ACUTIFORMIS Ehrh. Gors Llwyn, Brecon, WEBB. × RIPARIA. Old brick pit, Sandhurst, Gloster, gathered by Miss TODD. I suggest this hybrid, the plant being sterile.

*2561. × C. CSOMADENSIS Simonk. Some plants in Ansell's Herbarium, 1846, labelled *C. vesicaria*, from Frank's field, Brickendon, Herts, are undoubtedly this rare hybrid.

*2565. C. LASIOCARPA Ehrh. Lasynys Bog, Harlech, JONES.

*2567. C. PENDULA Huds. Woods of the Upper Medd, Brecon WEBB.

2570. C. HELODES Link. Selham, Sussex, DRUCE.

2572 (2). C. SADLERI Linton. Corrie above Beadheag, Glen Lyon, M. Perth, FOGGITT.

2575. C. FULVA Good. Darkadale, Hoy, Orkney, DRUCE.

2576. C. FLAVA L., var. OEDOCARPA Anders. Balta, Walls, Loch of Fleet, Tingwall, Shetland; Hoy, etc., Orkney, DRUCE.

2576. C. FLAVA × LEPIDOCARPA. With both parents at Darkadale, Orkney; Tingwall, Shetland, DRUCE.

2576. C. FLAVA × FULVA. Sawbridgeworth and Ashwell, Herts, as *fulva*, 1846, *Hb. Ansell*; a small form. Cannock Chase, Stafford; Moss of Darkadale, Orkney (perhaps *lepidocarpa* × *fulva*), DRUCE.

2577. C. OEDERI Retz. Harlech, MERIONETH; Kirbister, Orkney, DRUCE.

2578. C. EXTENSA Good. Near Kirbister, Orkney, DRUCE.

*2585. C. MONTANA L. Parkgate Forest, Isle of Wight, DRUCE. In company with Sir JAMES and Lady DOUIE I noticed this sedge in the spring of 1920, having just before predicted it as a likely plant to occur. Reference to *Top. Bot.* shows that it is new to the Island Flora, DRUCE.

2586. C. TOMENTOSA L. Barnsley, in still another locality near Cirencester, Gloster, GREENWOOD.

2589. C. PALLESCENS L. Marsh at La Motte, Jersey, 1851, PIQUET. This is not inserted in the body of the *Flora of Jersey*.

2591. C. PANICEA L. Exceptionally large specimens with spikelets two inches long, Thetford, W. Suffolk, Miss COBBE.

2593. C. LIMOSA L. Near Dumfries, J. CRUICKSHANK, 1839, ex *Hb. J. Backhouse*, a much earlier record than that given in the *Fl. Dumfries*. Moss of Darkadale, Orkney, BURDON, JOHNSTON & DRUCE.

2599. C. SALINA Wahl., var. KATTEGATENSIS (Fr.). In splendid condition by the Wick river, Caithness, about two miles above the town, growing with *C. aquatilis* (some specimens of which were four feet high) and hybridising with it, DRUCE.

2604. · C. GOODENOWII Gay, var. RECTA A. & G. Near Hertford, 1846, ANSELL. Var. CHLOROCARPA A. & G. Tingwall, Burrafirth, Shetland; Kirbister, Orkney, DRUCE.

2613. C. VULPINA L., var. NEMOROSA Lej. Beaminster, Dorset, GRAVESON.

2615. C. PAIRAEI F. Schultz. W. Sussex, DRUCE; Sandyford, Dublin, STELFOX.

2617. C. PANICULATA L. × VULPINA = × *BOENNINGHAUSIANA Weihe. Penzance, Cornwall, 1878, CURNOW, in *Hb. Piquet*; Bayswater, Oxford, DRUCE; Park Wood, Bramfield, Herts, GRAVESON.

2619. C. DIANDRA Schrank. Found by the Rev. R. J. BURDON with Col. JOHNSTON and myself in the Moss of Darkadale, Orkney. It is not given in *Fl. Orcadensis* but we subsequently learned that it had been previously found by Mr Scarth.

*2623. C. DIVISA Huds. Damp pasture, Woburn Park, Beds, JACKSON, in *Journ. Bot.* 91, 1920.

2625. C. INCURVA Lightf. Longniddry, Haddington, earliest evidence, 1858, BELL, in *Hb. Druce.*

2627. C. PAUCIFLORA Lightf. Eskdale, Cumberland, R. H. WILLIAMSON. Only one previously recorded locality in that county and that twenty miles away from the present record.

†2630. SETARIA VIRIDIS Beauv. Aldeburgh, E. Suffolk, A. B. COBBE; Beaminster, Dorset, GRAVESON.

†2631. S. GLAUCA Beauv. Aldeburgh, E. Suffolk, A. B. COBBE; Ide, Devon, Miss TODD; Beaminster, Dorset, GRAVESON.

2635. PANICUM ISCHAEMUM Schreber. Mullion, Cornwall. TRESIDDER.

†2654. PHALARIS PARADOXA L. Par, Cornwall, MEDLIN: railway tip, Malvern. Worcester, TOWNDROW; on dredged mud, Hertford, with *P. minor*, GRAVESON.

2655. P. ARUNDINACEA L., †var. PICTA L. By the Mailand Burn, and at Baltasound, Unst, DRUCE.

*2671. PHLEUM ALPINUM L. On the east face of Helvellyn, Westmorland, GILBERT ADAIR.

†2679. P. GRAECUM B. & H. On dredged mud, Hertford, GRAVESON.

†2680. P. PANICULATUM Huds. Eastham churchyard, Cheshire, 1842, H. SHEPHERD. Not mentioned in the *Flora*.

2683. AGROSTIS VERTICILLATA Vill. Mrs Wedgwood gathered it at St Sampson, Guernsey, in the summer. We had previously seen the foliage in April. Piquet's Jersey *verticillata* is *Agrostis alba*, var. He says it is plentiful on the north coast, but at present *verticillata* has obtained no hold in Jersey.

2684. A. ALBA L., var. STOLONIFERA (L.) Blytt. Nevin, Carnarvon, Miss COBBE. Var. COARCTATA Hack. Hoy, Orkney: Lerwick, Shetland, DRUCE. Var. MAJOR Gaud. Samares Miles, Jersey, 1865, as *Milium effusum*. The latter should be deleted from the Jersey Flora. Watton, Caithness, DRUCE.

2685. A. TENUIS Sibth., var. PUMILA (L.). Balta, etc., Ronas Voe, Shetland; Stenness, Hoy, Orkney, DRUCE. Var. ARISTATA. Winchmore Hill, Middlesex, L. B. HALL.

2690. POLYPOGON MONSPELIENSE L. Bowling Distillery, Glasgow, GRIERSON.

2693. CALAMAGROSTIS EPIGEIOS Roth. *Glen More, Easterness, over 900 ft., a considerable extension of its range, Mrs WEDGWOOD and DRUCE; Limeslade, Glamorgan, WEBB.

2706. AIRA CARYOPHYLLEA L. Hoy, Darkadale, Finstown, Orkney, DRUCE & JOHNSTON.

2711. DESCHAMPSIA SETACEA Hack. Near Woking, Surrey, Lady DAVY.

2717. AVENA FATUA L., var. HYBRIDA (Peterm.) Asch. Chichester, W. Sussex, DRUCE.

†2719. A. STRIGOSA Schreb. Trinity, Jersey, 1905, PIQUET.

2722. A. PUBESCENS Huds. Darkadale, Orkney, DRUCE.

2725. ARRHENATHERUM TUBEROSUM (Gilib.) Druce. Baltasound, Unst, Ronas Voe, Shetland; Kirkwall, Orkney, DRUCE; *Portskewett, Monmouth, *Fl. Chepstow.*

†2726. GAUDINIA FRAGILIS Beauv. Ryde, Isle of Wight, H. H. KNIGHT; Glasgow, GRIERSON; Pyrford, Surrey, Lady DAVY.

†2737. CYNOSURUS ECHINATUS L. Thetford Heath, Warren Heath, Ipswich, Suffolk, M. COBBE; Drayton, Middlesex, DYMES; on mud from river, Hertford, GRAVESON.

2738. C. CRISTATUS L. A viviparous and panicled form at Newport, Countess Wear, Devon, D'URBAN.

*2746. CATABROSA AQUATICA Beauv. Moors, Monmouth, *Fl. Chepstow.*

†2755. BRIZA MAXIMA L. Glasgow, a small spikeletted form, GRIERSON.

†2757. B. MINOR L. Bootle, Liverpool, 1817, H. SHEPHERD.

2759. POA PRATENSIS L., var. LATIFOLIA Weihe. A large spikeletted form at Bettyhill, W. Sutherland; Dornoch, E. Sutherland; Clova, Forfar; Hambledon, Bucks. Var. SUBCAERULEA (Sm.). Shell sand, John o' Groats, Caithness; Balta, Unst, Shetland, DRUCE.

*2759 (2). P. IRRIGATA Lindm. Ballater, S. Aberdeen, with shorter and broader glumes, near *sylvestris* Lindm., DRUCE.

†2760. P. PALUSTRIS L. Near Salisbury, Wilts, GODDARD.

2762. P. NEMORALIS L. Bagley Wood, Berks. See *Rep. B.E.C.* 531, 1918. This eximious form comes nearest to var. *Reichenbachii* (A. & G.), teste Lindman. DRUCE.

2765. P. COMPRESSA L. On a wall near Dublin, STELFOX, in *Irish Nat.* 1920.

2772. GLYCERIA FLUITANS Br., var. TRITICEA Lange. Claxton, E. Norfolk, BROWN; near Tongue, W. Sutherland; Ronas Voe, Shetland, DRUCE. × PLICATA. Alphamstone, N. Essex, BROWN.

*2773. G. PLICATA Fr. Samares, Jersey, PIQUET.

2776. G. MARITIMA Wahl., *var. DISTANTIFORMIS Druce. Kirkwall, Orkney, DRUCE.

2776. G. MARITIMA × DISTANS. Chichester, W. Sussex, DRUCE.

*2778. G. PROCUMBENS Dum. Marais à la Cogne, Jersey, 1876, PIQUET.

2782. × FESTUCA ADSCENDENS Retz. Beaminster, Dorset; Askham Bog, York, GRAVESON.

2785. F. RUBRA L. Burrafirth, etc., Shetland; Kirkwall, Orkney, DRUCE.

2787. F. OVINA L., var. FIRMULA (Hackel). Plemont, Jersey, DRUCE.

2787 (2). F. TENUIFOLIA Sibth. Moor in Staffordshire, Sir R. CURTIS & DRUCE.

†2794. BROMUS RIGENS L. Hayling Camp, Norfolk, A. B. COBBE; Ware, Hertford, GRAVESON; Daglingworth, Gloster, GREENWOOD.

†2797. B. TECTORUM L. St Ouen's, Jersey, 1900, PIQUET.

†2798. B. MADRITENSIS L. Glasgow, GRIERSON; St Anne's Port, Jersey (the type), *Hb. Piquet.*

†2803. B. UNIOLOIDES H. B. K. Thetford Heath, W. Suffolk; Thetford Bridge, W. Norfolk, A. B. COBBE.

†2806. B. SECALINUS L. A pretty form with short, few-flowered spikelets, Chichester, Sussex, DRUCE.

2809. B. ARVENSIS L. Rondham, Norfolk, A. B. COBBE; Grouville, Jersey, 1856, as *erectus*, PIQUET.

†2812. B. INTERRUPTUS Druce. Rendcombe Aerodrome, Gloster, GREENWOOD.

*2819. BRACHYPODIUM PINNATUM Beauv. Portumna, Galway; Curragh, Dublin, PHILLIPS, in *Irish Nat.* 1920.

†2821. LOLIUM TEMULENTUM L. Thetford, W. Norfolk; Felixstowe, E. Suffolk, A. B. COBBE.

†2823. L. MULTIFLORUM Lam. (sub-sp. BOUCHEANUM), var. COMPOSITUM (Thuill.). Very luxuriant specimens in a field at Pyrford, Surrey, Lady DAVY & DRUCE.

2827. AGROPYRON JUNCEUM Beauv. Birsay, Orkney, DRUCE.

2827. A. JUNCEUM × REPENS = × A. HACKELII Druce. St Clement's Bay, Jersey, 1851, as *junceum*, PIQUET.

*2828. A. PUNGENS R. & S. Near Chepstow, Monmouth, *Fl. Chepstow.*

2830. A. REPENS Beauv., var. TRICHORACHIS Rohl. Near Hitchin, Herts, LITTLE. Var. GLAUCUM Doell. Jersey, as *litorale*, PIQUET.

†2842. TRITICUM CYLINDRICUM C. P. G. Brislington Tips, N. Somerset, 1921, Miss ROPER.

†2845. LEPTURUS FILIFORMIS Trin. In the Churchyard of Stansfield, W. Suffolk, two plants only. Unusual in an inland situation, LITTLE.

†2850. HORDEUM MARINUM Huds. Woodside, Cheshire, 1818, H. SHEPHERD. Doubtless alien.

†2850 (2). H. VIOLACEUM Boiss. & Hohen. Hayling Island, S. Hants, Miss HILLARD.

†2851. H. JUBATUM L. Hayling Island, S. Hants, Miss HILLARD; Ware, Herts, GRAVESON.

2858. ELYMUS ARENARIUS L. On the shores of the tempestuous Burrafirth, Unst, plants were growing on a detached rock, 30-40 feet above sea-level, DRUCE; *St Aubin's, Jersey, 1911, PIQUET. Probably planted.

2867. × EQUISETUM LITORALE Kühl. In abundance on the canal side near Woking, Surrey, Lady DAVY, an excellent discovery. The Rev. E. A. Woodruffe-Peacock says he found *litorale* × *arvense* at Holton-le-Moor and *E. fluviatile* × *arvense* in an estuarine ditch at Barton and in a sandy clay-pit (Kimmeridge Clay) at Holton, Lincoln. On the edge of the railway near Ballymena, Co. Antrim, PRAEGER, in *Irish Nat.* 1920.

2868. E. SYLVATICUM L., var. CAPILLARE Hoffm. Wilton Brails Wood, N. Wilts, HURST.

2877. ADIANTUM CAPILLUS-VENERIS L. Morecombe Bay, about 20 years since, STANSFIELD.

2881. ASPLENIUM TRICHOMANES L., var. FURCATUM. Panshanger garden wall, Herts, and A. foliis eleganter incisis (Dill.), Rant Clough, near Burnley, Lancs., *Hb. Ansell.*

*2887. A. GERMANICUM Weiss. Near Kirkby Lonsdale, Westmoreland, STANSFIELD; Iona, Miss GODMAN. This may possibly be the *pseudo-germanicum* of *Ruta-muraria*. I have not seen a specimen.

2892. POLYSTICHUM SETIFERUM Woyn., var. MULTIFIDUM. St Saviour, Jersey, PIQUET.

2893. P. LOBATUM Huds., var. LONCHITIOIDES. Einon Gon Fall, Brecon, BLACKBURN.

2894. P. LONCHITIS Roth. Still at Blaenau, Merioneth, JONES.

*2903. DRYOPTERIS THELYPTERIS Underw. South side of Ballymoney Lough, Louth, BRUNKER.

2904. CYSTOPTERIS MONTANA Desv. In *Journ. Bot.* 24, 1920, Mr C. E. Salmon draws attention to a record of the plant from Benrinnes, Banff, in Smiles' *Life of Thomas Edward*, and says that he is unable to find it in *Top. Bot.*; but Watson states that Roy says the Banffshire record was an error. Does Roy here refer to Edward's statement?

2919. BOTRYCHIUM LUNARIA Sw. Balta, Burrafirth, Shetland; Stenness, Orkney, DRUCE.

2920. OPHIOGLOSSUM VULGATUM L. Summer Isles, W. Ross, Miss BUXTON. Unfortunately the specimen was not preserved, so one is unable to say if type or var. *polyphyllum* Braun was found. The variety is at Morfa, Harlech, where Mr D. A. Jones kindly showed it to me.

*2929. LYCOPODIUM CLAVATUM L. Brecon Beacons, etc., WEBB.

2930. L. INUNDATUM L. Cwm Bychan, Merioneth, JONES. Previously found by W. PAMPLIN.

2931. L. SELAGO L. The earliest evidence for Fife is at Saline, 1857, BELL, in *Hb. Druce.* Spontaneously in the garden at Bar Hill, Madeley, Stafford, DALTRY. Mr Daltry had previously collected the plant in Wales and he suggests that the seedlings may have come from spores brought home inadvertently.

2934. NITELLA OPACA Ag. As an extraordinarily robust plant, Tingwall, Asta and Bardister Lochs, Shetland, DRUCE.

*2941 (2). TOLYPELLA NIDIFICA Leonh. In some quantity and over a considerable area of the Loch of Stenness, Orkney. Found in company of Prebendary Burdon, Col. H. H. Johnston and T. Churchill in August 1920. An interesting extension of its range and a new plant to Britain. Its previous British history rested on a too advanced specimen found in 1896 by the Rev. E. S. Marshall in a lagoon north of Wexford Harbour. His specimen was too imperfect to be figured.

*2944. T. INTRICATA Braun. Brickhill, Bucks, DRUCE.

*2948. CHARA CANESCENS Lois. Loch of Stenness, Orkney, 1920, DRUCE. New to Scotland.

*2950. C. CONTRARIA Braun, forma. Lough Mullaghderg, Donegal, BULLOCK-WEBSTER, in *Irish Nat.* 1920.

2955. C. ASPERA Willd. Kirbister, Orkney; Loch Leven, Kinross, DRUCE.

2955 (2). C. DESMACANTHA Groves. Asta Loch, Loch of Fleet, Bardister, Tingwall, Shetland; Kirbister, Loch of Harray, Stenness, Orkney, DRUCE.

2958. C. DELICATULA Braun. Strathpeffer, E. Ross; Tingwall, Bardister, Shetland, DRUCE.

BRITISH FORMS OF CENTAUREA JACEA L.

By C. E. BRITTON.

The early notices of *Centaurea Jacea* that appear in our floras record it as occurring in England and the north of Ireland at solitary localities, in which it curiously appears not to have been found by later observers. As to the Irish record, I have been so fortunate as to interest in the matter Miss M. C. Knowles, of the Botanical Department, National Museum, Dublin, who has, on my behalf, kindly examined the *Centaurea* specimens contained in the large Irish herbarium of the institution with which she is connected, without finding any Irish-gathered specimen of *C. Jacea*. Miss Knowles has also been unsuccessful in searching for a reliable record of the species occurrence in Ireland. It does not find a place in the *Hand List of Irish Flowering Plants and Ferns*, 1913, which includes alien and casual plants, and no recent notice of the plant's occurrence in Ireland is known. The records mentioned in *Cybele Hibernica*, 1866, are referred to *C. nigra*, var. *radiata*, and concerning the Kerry record of the *Flora Hibernica*, 1836, Mr Reginald Scully in his *Flora of County Kerry*, 1916, is of opinion that the radiant form of *C. nigra* was the plant observed. For the foregoing I am indebted to my correspondent, who also directs my attention to the notice of *C. Jacea* in the *Flora of the North-East of Ireland* by Messrs S. A. Stewart and T. H. Corry, 1888, p. 295: "*C. Jacea* L. — In a field near Drumbridge; Templeton. Gravelly bank at Enagh Lough (Moore): *Flor. Hib.* Templeton's plant, which has been quoted in *Flora Hibernica*, *Flora Belfastiensis*, and *Flora of Ulster*, was probably the form *C. nigra* with large ray-flowers. Dr Moore corrected the name of his Derry plant and placed it as a variety under *C. nigra*." Rather strangely, the authors of the *Flora of the North-East of Ireland* appear to have overlooked the fact that Templeton's plant was also quoted by Sir J. E. Smith in the *English Flora* iii, p. 465, where we read, "Sent from Ireland in 1796, by Mr Templeton." Fortunately, the plant is preserved in Smith's herbarium, and by the courtesy of Dr B. Daydon Jackson, the secretary of the Linnean Society, I have had an opportunity of inspecting it and find that it is unquestionably a form of *C. Jacea*, almost identical with plants found in various parts of England. This confirmation of Templeton's record should prove of interest to Irish botanists and, I hope, lead to the plant's re-discovery.

In other British herbaria consulted by me, no Centaureas from Ireland have been seen which could be placed to *C. Jacea*. The first English record rests upon Borrer's Henfield plant, which, it seems, was found in very limited quantity, as existing specimens in herbaria are from cultivated plants. Besides Henfield, *C. Jacea* has been recorded from several other Sussex localities, stretching thence eastward to the Kent border. Arnold, in his *Flora of Sussex* enumerates localities near Plumpton, Fletching, Fairlight and Guestling, and two other records are supplied by Mr C. E. Salmon in his notes on the county flora that have appeared in the *Journal of Botany* from the neighbourhood of Hassocks and Cuckfield. Adverting to the status of *C. Jacea* in Britain, whether it is an introduced species wherever it occurs or is native at some of its recorded localities, the evidence seems in favour of the latter view, and a modern survey of its distribution in Sussex, the conditions under which it grows, and its relative abundance, would go far to settle this point. Plants very diverse in their aggregate characters have been included within the limits of *C. Jacea*, and a study of the Sussex plants recorded as this species shows that they are by no means identical, and can readily be arranged under at least three forms, none being typical *C. Jacea* as understood by continental authors. So far, herbarium examples from five of the seven recorded Sussex localities have come under my notice, and a small-headed, narrow-leaved form that is represented at four different places is most likely that to be met with elsewhere as a native plant. During the past year it was found in Surrey, and I anticipate it being met with in other of the southern counties. That but few plants were seen at the Surrey locality is no real objection to regarding it as a native there; indeed, the presence of somewhat similar plants, distinguished by the extent to which the phyllary-appendages were fimbriate, probably explains the reason why *Jacea* was not seen in quantity—by crossing with *C. nigra* it is being absorbed into that dominant form of *Centaurea*. Elsewhere, *C. Jacea* is accompanied by similar supposed hybrids with *C. nigra*, which are described further on.

An endeavour has been made to identify the forms of *C. Jacea* occurring in Britain with authentic examples of named continental plants, and where success has not attended such efforts our plants have been arranged in accordance with the system of Gugler. As this botanist's work ("Die Centaureen des ungarischen National Museums" in *Annal. Hist. Nat. Musei nation. Hung.* vi., p. 219, 1908) on *Centaurea* is practically unknown to British botanists, a few explanatory words may be of interest. In the section *Jacea*, Gugler recognised three species only, viz., *C. Jacea*, *C. nigra*, and *C. nigrescens*. The first of these is again divided into three sub-species—*eu-Jacea*, *jungens*, and *angustifolia*. Each sub-species included three homologous varieties, based upon the character of the phyllary-appendages—whether more or less entire or progressively pectinate-fimbriate. A further sub-division was made into parallel series of forms. Gugler's views were of a synthetical nature, as he did not hesitate to refer to the same low grade of form diverse plants which have been regarded by other botanists as distinct species. The distinctions of the three sub-species of *C. Jacea* are founded chiefly on habit, *eu-Jacea* having fairly broad leaves and stems with rather short flowering branches; *angustifolia* with longer, sometimes virgate, branches and narrow leaves, and *jungens* with characters intermediate.

Gugler's classification has been adopted by certain continental botanists, notably Schinz and Keller (*Fl. der Schweiz*) and Vollmann (*Fl. von Bayern*), the latter giving a most useful summary of the different forms.

CENTAUREA JACEA L., sub-sp. C. EU-JACEA Gugl.—" Stem with rather short branches, seldom simple or with secondary branches. Peduncles usually inflated beneath the capituli; phyllary-appendages light to blackish-brown, seldom white. Leaves elliptic-lanceolate to lanceolate, never linear-lanceolate or linear, the upper leaves always proportionately broad, basal and lower leaves short, more or less lingulate. Peduncles with few spreading and scattered leaves. More or less glabrous or quite glabrous, rarely felted or tomentose. Stature medium (seldom more than 30 centim. high), shade-grown plants taller and those of barren places sometimes diminutive."

Var. TYPICA Gugl.—Phyllary-appendages entire, or more or less irregularly torn, never distinctly pectinate.—v.-c. 17, Surrey, Warlingham, in a meadow 1905; Epsom Downs, 1917 (Ref. No. 1832). Probably adventive, as solitary plants only were seen in these localities. A specimen in *Herb. Brit. Mus.* labelled *C. Jacea*, var. *crispo-fimbriata* Koch, gathered on the site of the Exhibition of 1862, is a small-headed form of sub-sp. *eu-Jacea*. The phyllary-appendages are not sufficiently cut up nor wavy enough for it to be the plant that it is named.

Vars. SEMIPECTINATA Gugl. and FIMBRIATA Gugl. are characterised by the extent to which the appendages are regularly fimbriate. No British plants have been seen that are referable to these varieties.

CENTAUREA JACEA L., sub-sp. C. JUNGENS Gugl.—" Branches of moderate length, the upper sometimes short. Upper leaves broadly lanceolate. Peduncles always clearly inflated beneath the capituli and with rather few leaves. Tall plants intermediate in habit between the preceding sub-species and sub-sp. *angustifolia.*" /

Var. FIMBRIATISQUAMA Gugl.—Is characterised by the phyllary appendages being nearly all regularly pectinate-fringed; the innermost (upper) series, however, always more or less entire, the next uppermost series less regularly laciniated.—v.-c. 17, Surrey, Woldingham, 1919; v.-c. 20, Herts., north of the Welwyn tunnel, 1913; coll. J. E. Little and distributed through the Botanical Exchange Club, (see *Report* 1913, p. 476). Other plants from various localities in the southern counties are very probably referable here. /.

CENTAUREA JACEA L., sub-sp. C. ANGUSTIFOLIA Gugl.—" Stem seldom simple, usually with elongated branches, which are again divided. Peduncles slender, many-leaved, not inflated, or very slightly so, beneath the capituli. Leaves lanceolate to linear, the upper smaller, and usually erect on the flowering branches. Stem and leaves more or less tomentose, seldom quite glabrous. Involucre as conspicuous as in *C. eu-Jacea.* Tall plants seldom less than 30 centim. in height, often much taller, but plants growing in barren situations usually much smaller." /3

Var. INTEGRA Gugl.—Has the phyllary-appendages similar in character to those of sub.-sp. *eu-Jacea*, var. *typica.* Under this variety of the sub-species, *C. angustifolia* Gugl., may be placed Templeton's Irish plant and also most of the plants recorded as *C. Jacea* from all the English localities in which it is established, either native or naturalised. Collectively, they present the following features:—Pubescent or arachnoid. Basal leaves oblanceolate, serrate, long-stalked, reaching a length of 36 centim. Stem 35 to 45 centim. or more in height, branches few or many, erect-ascending, the lower 12 to 20 centim. long. Cauline leaves usually entire, pubescence appressed, ranging from linear-oblanceolate to linear, mid-stem leaves elongated (sometimes attaining to 80 mm. by 8 mm.), the upper smaller, the ultimate involucrate equalling or exceeding the capituli. Heads globose, medium, appendages light to dark brown, glistening, the lowest at times whitish, the basal very small /

and pectinate, remainder entire or somewhat lacerate, sometimes denticulate, but not pectinate. Outer florets rayed or not.

V.-c. 13, West Sussex, Henfield, Borrer.—Cultivated examples are in the herbaria at Kew, South Kensington, and in that of the Linnean Society. I am not aware that the plant has been found by any botanist other than Borrer. Abundant in a paddock between Hassocks and Hurstpierpoint (doubtfully native), 1900. T. Hilton, (C. E. Salmon in *Journ. Bot.* 1901, p. 414). Under the name of *C. Jacea* specimens were distributed by Mr Hilton through the Watson Exchange Club. It is probable that more than one form was included, as besides the plant placed here (specimens in *Herb. South London Botanical Institute*, under the date of Sept. 1905) Mr Hilton's gatherings also included the plant identified as *C. subjacea*, Hayek (specimen in *Herb. C. E. Salmon*) and that (*Herb. South London Botanical Institute*) referred to the hybrid *C. angustifolia* × *nemoralis*.

V.-c. 14, East Sussex, Plumpton Cross-ways, 1872, Unwin, (Arnold *Fl. Sussex*).—In *Herb. C. E. Salmon* are two scrappy portions of plants collected in Aug. 1905, at Plumpton, by the late T. Hilton and the Rev. E. Ellman. The label is noted " All we could find; Mr Ellman thinks this is the place given by Arnold as near Plumpton Cross-ways." The specimens are named *C. Jacea* and represent two dissimilar forms, one being sub-sp. *angustifolia*, var. *integra*, the other probably a hybrid between this and *nigra*. Fairlight, July 7, 1883 (Rev. E. N. Bloomfield in *Herb. Brit. Mus.*).—In two interesting notes in *Journ. Bot.* 1884, pp. 149-248, the Rev. E. N. Bloomfield, who detected it at two localities, rightly pointed out that it is extremely liable to be overlooked for the common *C. nigra*, especially when not in flower and growing amongst tall grass. I can confirm this observation, having precisely a similar experience on Epsom Downs, Surrey. As at the Plumpton locality, *angustifolia* is at Fairlight accompanied by forms (specimens in *Herb. C. E. Salmon*) which may be considered as derived from crossing with *C. nigra*. These plants are sparingly branched, branches elongated, leaves mostly linear-lanceolate, heads globose, phyllary-appendages dark brown, closely imbricate, the lower regularly pectinate, the median fimbriate, uppermost more or less entire. Guestling.—At this locality the plant was first observed by Rev. E. N. Bloomfield about the year 1864 (specimen in *Herb. Kew*) and was seen twelve years later in a neighbouring station.

V.-c. 17, Surrey, Epsom Downs, Aug. 1920 (Ref. No. 2269), in small quantity but apparently native, and with the heads rayless. In 1910 and 1911 a variation with light-coloured phyllary-appendages, rather irregularly lacerate, occurred at the golf links near Byfleet; specimens are in various private herbaria and at Kew and the British Museum. The specimens at the latter establishment include a scrap of what is very probably sub-sp. *jungens*, var. *fimbriatisquama*.

V.-c. 21, Middlesex. Formerly at Twickenham, in a situation now built over. The authors of the *Flora of Middlesex* recorded it as being in considerable plenty, thoroughly established, and having the appearance of a native plant. The presence, however, of certain plants in the vicinity that were formerly cultivated is mentioned, but, as *C. Jacea* is not to my knowledge a plant of garden culture, I am unable to support the implied inference. Examples of the Twickenham plant are frequent in herbaria.

V.-c. 22, Berks. At Wellington College (*Journ. Bot.* 1919, p. 340), where it is naturalised. At this locality occur plants indistinguishable from the Sussex and Middlesex form, as well as several allies.

V.-c. 69, N. Lancs., Cark, 4 Aug. 1870; coll. W. M. Hind (specimen in *Herb. Brit. Mus.*).

Ireland.—Templeton's plant before referred to as being in the possession of the Linnean Society is presumably from the recorded station at Drumbridge. It is a portion of a plant measuring about 25 centim. in length. One detached lower leaf is oblanceolate, pinnatifid, but the upper leaves are linear-lanceolate entire. The heads are pale-coloured, about 2.5 centim. by 3 centim., the phyllary-appendages mostly irregularly torn, and outer florets radiant. On the sheet in Smith's handwriting is the name "*C. Jacea* Eng. Bot. t. 1678" and the note "Ireland; Mr Templeton, 1796."

Channel Isles.—Near Don Bridge, Jersey, July 1898; coll. J. W. Hurst (as *C. nigra* L., var. *decipiens* Thuill. in *Herb. Druce*); meadow in Valley des Vaux, Jersey, Aug. 1876, Dr Bull (*Herb. Druce* as "*Centaurea serrotina* Borr." (*sic*). The first of these plants is almost identical with plants from the golf links, Byfleet, 1911.

A frequent Wellington College form, also the plants from Guestling and Fairlight (some), have great affinities with *C. bracteata* Scop. and with *C. pannonica* Heuff., but are not either of these exactly. On the other hand, the plants from Hassocks, Epsom Downs, Byfleet, Drumbridge and Don Bridge are closer in characters to *C. amara* L. as described by French authors. Gugler, however, did not recognise *C. amara* L. and placed plants referred to that species under his sub-sp. *C. angustifolia*.

Var. SEMIFIMBRIATA Gugler.—Outer phyllaries, to about the middle of the head, with regularly pectinate-fringed appendages. There are 1-2 series of appendages transitional between lower appendages and the entire upper series.—v.-c. 22 Berks., Wellington College, 1919 (Ref. No. 2157).

Besides the British plants referred to the foregoing sub-species and varieties, other forms occur which appear identical with the following species:—

C. SUBJACEA Hayek. A specimen in *Herb. C. E. Salmon* received through the Watson Exchange Club, under the name *C. Jacea* Linn., gathered by the late T. Hilton in a paddock at Hassocks, E. Sussex, v.-c. 13, June, 1900, is identical with the plant distributed by Dr A. V. Hayek as No. 594 of his *Flora stiriaca exsiccata*, and described in full in *Die Centaurea-arten Oesterreich-Ungarns*, where its wide distribution in the territories of the former Austro-Hungarian Empire is indicated, and a long list of synonyms given. Elsewhere in Sussex the same form has been collected by Dr G. C. Druce at Lewes, v.-c. 14, and was found in Surrey, v.-c. 17, in a meadow at West Molesey by H. C. Watson in 1880 (specimen in *Herb. Kew* as "*C. nigra*, var.") Mr Hilton's observations on the plants recorded by him as *C. Jacea* were that they were naturalised only, though occurring abundantly. His estimate of this status deserves further study, and, now that attention has been drawn to *C. subjacea*, it may possibly be recognised elsewhere. It is a medium-sized plant, reaching about 2 feet in height, stems erect, branches few, leaves green, sparingly hairy, lower stalked, ovate-lanceolate, entire or sinuate-dentate, the middle and upper leaves obovate-oblong or oblanceolate. Capituli solitary, ovoid-globose, about 14 mm. long, phyllary-appendages dark-brown, scarious, the innermost series roundish, more or less entire, succeeding series lacerate, lowest series triangular, pectinate. Flowers described as clear-crimson, the outer rayed. Fruit pubescent, without pappus.

C. NEMOPHILA Jord. MS. Two not quite identical plants have received this name: (1) that distributed by Billot (No. 3628), which was a cultivated plant grown from seeds received from Jordan, and (2) that distributed by Hayek as *C. Jacea*, sub-sp. *nemophila* (Jord.), which is chiefly distinguished from the first by its markedly virgate habit and less fimbriated appendages. As, however, the plants representing Hayek's sub-species were gathered in France, it is probable that the extent to which they differ from Billot's No. 3628 is due to the latter being a cultivated plant. Hayek's plant is slightly arachnoid, leaves linear, acute, reaching 7 centim. in length, the lowest visible leaves provided with two linear acute lobes at base. Heads globose, outer florets rayed; appendages with dark-brown centres and paler margins. At Wellington College, Berks., v.-c. 22, plants occur which cannot be kept apart from *C. nemophila* Jord. They exhibit closer agreement with Hayek's plant than with Billot's but, no doubt all three are mere variations of one form. Most likely, similar plants will be detected elsewhere, as I have gathered it as a slender form (Ref. No. 2040) in a pasture at Lower Morden Surrey, v.-c. 17. Gugler referred *C. nemophila* to his *C. angustifolia*, var. *pseudofimbriata*, and Rouy placed it to *C. Ruscinonensis* Boiss., which, in his arrangement of the "formes" or races of *C. Jacea*, follows *C. decipiens* Thuill.

C. VIRETORUM Jord. As distributed by Billot in *Pl. Gall. et Germ.*, No. 3629, this was also a cultivated plant raised from seed received from Jordan. Apparently a large plant, green, much-branched, leaves linear-lanceolate, acute, usually entire except for a pair of linear basal lobes. Capituli globose, appendages mostly pale-brown (biscuit-coloured), the lower with darker centres, upper dentate, lower pectinate or fimbrillate, divisions wide. Flowers bright-pink, outer radiate. At Woldingham, Surrey, v.-c. 17, plants (Nos. 2109 and 2130) have been collected which come under Jordan's name, only differing by being smaller, less branched, leaves less acute, and the lower appendages more finely fringed. Although I have seen but few plants, I was assured by my friend, Mr A. Beadell of

Warlingham (to whom I am much indebted for assistance in the field), that this form was plentiful at Woldingham in 1919, flowering rather late.

By Rouy *C. viretorum* is referred to *C. amara* L., sub-var. *Loiseleurii* characterised by the appendages being more or less whitish, whilst Gugler placed it as a synonym of his *C. angustifolia*, var. *integra*, sub-var. *pannonica*.

The occurrence, side by side with typical forms of *C. Jacea*, of related plants showing much laciniated phyllary-appendages, is an interesting feature. Such plants are well-known on the Continent, where they are usually regarded as of hybrid origin. Similar plants occurring in this country are described in the following latin diagnosis (based upon my notes), which I owe to the kindness of Mr C. E. Salmon :—

C. Jacea L., sub-sp. *C. angustifolia* Gugl. × *C. nemoralis* Jord. = × *C. Monktonii* mihi.

Plant arachnoid or slightly pubescent. Stem erect or decumbent. Lower cauline leaves oblanceolate, sometimes pinnatifid, lobes few, oblong, obtuse, or acute ; margin entire or irregularly serrate ; upper leaves linear-lanceolate, entire. Capituli small to medium, often arachnoid at base ; phyllary-appendages light-brown to dark-brown, more or less imbricate, the lowest often whitish, teeth especially so.

The appendages are either elongate-triangular or roundish, regularly or irregularly pectinate as far as the centre of anthode, succeeding appendages lacerate, the uppermost more or less entire. Florets rose-purple, the outer radiant or not.

Planta tela arachnoida vestita vel leviter pubescens. Caulis erectus vel decumbens. Folia caulina inferiora oblanceolata, interdum pinnatifida, lobis paucis oblongis obtusis vel acutis, margine integra vel inaequali ter serrata ; folia superiora integra lineari-lanceolata. Capitula parva vel mediocria, saepe basi arachnoidea ; squamarum appendices dilute vel saturate brunneae, plus minusve imbricatae, infimae praesertim ad dentes albescentes. Appendices inferiores elongato-triangulares vel rotundulatae, aequaliter vel inaequaliter pectinatae ; appendices superiores laceratae, supremae plus minus integrae. Corollae roseo-purpurae, extimae ligulatae vel omnes tubulosae.

The plants referred to this hybrid are so variable in character that measurements of the organs have been omitted as valueless. Occurs in the company of the reputed parents at Epsom Downs, Surrey, v.-c. 17 (Ref. Nos. 2268 and 2270); at Hassocks, W. Sussex, v.-c. 13, collected by the late T. Hilton (as "*C. Jacea,*" one specimen in *Herb. South London Botanical Institute*), and is, in part (specimens in *Herb. C. E. Salmon*), the *C. nigra* L., var. *decipiens* (Thuill.) of Mr H. W. Monkton's *Flora of the Bagshot District*. I have seen other examples from Mr H. W. Monkton's herbarium collected at Wellington College, Berks, v.-c. 22, where I also have collected it. It resembles *C. Gerstlaueri* Dörfler (*C. Jacea* × *nigra*), but exhibits obvious differences due to its parentage.

The preceding notes have been compiled with a view of drawing renewed attention to a small group of very interesting but highly critical plants. In the opinion of the writer, much work in the field and herbarium yet remains to be accomplished before the materials can be acquired necessary for an adequate knowledge and arrangement of the various allied plants that may be placed under the aggregate name of *Centaurea Jacea* Linn. It is a pleasurable duty to acknowledge the great encouragement and assistance received from Dr G. Claridge Druce and Mr C. E. Salmon, F.L.S., both of whom have placed their herbaria at my disposal. To the late Rev. E. S. Marshall, Mr W. C. Barton, F.L.S., and various other correspondents grateful acknowledgments are also due, and it is hardly necessary to say that little progress could have been made without recourse to the libraries and collections at Kew and South Kensington, from whose custodians, notably Messrs A. J. Wilmott and E. G. Baker, much valuable assistance has been received. The collections and library of the South London Botanical Institute have also proved very useful.

A summary of the forms of *C. Jacea* claimed as British is appended:—*C. Jacea*, sub-sp. *C. eu-Jacea* Gugl.; *C. Jacea*, sub-sp. *C. jungens* Gugl., var. *fimbriatisquama* Gugl.; *C. Jacea*, sub-sp. *C. angustifolia* Gugl., vars. *integra* Gugl. and *semifimbriata* Gugl.; *C. subjacea* Hayek; *C. nemophila* Jord.; *C. viretorum* Jord.; and × *C. Moncktonii* mihi. It is intended to place a representative set of specimens in the National Herbarium at South Kensington.

VIOLET NOTES IN 1920.

E. S. GREGORY.

The Violet Season of 1920 has been the most prolific for many years. My residence at Weston-super-Mare, during winter and early spring, gave me opportunities of studying in the field the many species, varieties and forms that abound in the neighbourhood.

The var. *praecox* of *V. odorata* was in flower long before Christmas 1919, and I gathered the last flower of the season during the third week in February, just as *V. odorata*, var. *violacea* was in early bloom. I have examined the plants carefully at intervals all through the season, and have not detected a single capsule either from open or cleistogamous flowers. My belief is that it, alone of violets, increases simply by vegetative reproduction. This it accomplishes most effectually.

A new colour-form of *V. odorata* attracted my attention in a hedge-row near Banwell, Somerset, late in February. It corresponds with the var. *variegata* of *V. hirta*, excepting that the combined colours give the general impression of a sky-blue flower. The name *caerulea* suggested itself to me. On examination under the lens the corolla proved to be white, with streaks and blotches of palish purple.

Another form of *V. odorata*, from the same locality, differs from type by having the long narrow leaves of *V. hirta*.

Miss Peck sent me two interesting forms of *V. hirta* × *odorata* from an orchard in South Devon.

One of the forms had :—*Leaves*—(spring) small, glabrescent, with hairy petioles; (summer) on elongated hairy petioles (8-10 cm.); lamina (3-4 by 3-4 cm.), dark green. *Flowers*—paler colour than those of ordinary *V. hirta* (2½ by 2 cm.); *upper petals* greatly recurved on the peduncle, narrow; *lateral* slightly bearded; *sepals* orbicular; *spur* short, scarcely exceeding sepaline appendages; *anther-spurs* very short. Miss Peck sent this form as a "new *hirta*." The direction of hairs points, however, to a × or variation of *V. hirta* × *odorata*.

The second form, from the same habitat, had :—*Leaves*—broad (5½ by 5 cm.); *petioles* with the characteristic hairs of *V. hirta* ×

odorata hybrids (midway between patent and depressed). *Flowers*—pure white, large (3 by 2½ cm.); *sepals* oblong; *petals* narrow, devoid of scent; *spur* pale-coloured, mottled (not nearly so deep-coloured as in *V. dumetorum*), revolute, with a little 2 mm. tail on the apex, evidently a ×, mutation, or variation of *V. hirta* × *odorata*.

Another interesting little plant, which has been sent to me from various localities during the last three years, I have named tentatively *V. rupestris*, var. *glabrescens*. It is a minute plant with tiny, dark-coloured leaves, and it bears small lilac flowers, which have long narrow petals. The profile of the flower is extraordinarily long and narrow, but perhaps its most striking character is displayed by the stipules, quite unlike those of the *sylvatica* group, to which at first sight the plant appears to belong. The stipules of this plant suggest affinity with *V. rupestris*: they are broad enough and have processes rather than teeth, a character which also appertains to all *canina* forms. The smallness of the plant, the smallness of its dark foliage, the shape of its individual leaves, accord with the same characters in our north country var. *arenaria* of *V. rupestris*, but the shape of the flower, especially of its long narrow profile, does *not* accord with var. *arenaria*.

Further investigation is required before we can give the plant a permanent name. Meanwhile, I commend it to the study of botanists, more particularly to violet students. It keeps going in my violet patch in the Cambridge Botanical Gardens retaining its characters intact. Dried examples may be seen in my collection in the Natural History Museum, at South Kensington.

MISCELLANEOUS NOTES.

It is with the good wishes of the members that Mr Charles Bailey, who acted as Secretary from 1879 to 1902, is chosen to fill the vacancy as the only British Honorary Member, caused by the death of Mr J. G. Baker, a former Secretary. The Rev. F. Alston is still at his old address, Scrivelsby Rectory, Lincolnshire. Hearty congratulations are offered to Prof. I. Bayley Balfour on being created K.C.B.E., to Professor F. W. Keeble, F.R.S., on his filling the chair as Sherardian Professor at Oxford, and to Dr A. H. Church on his being made a Fellow of the Royal Society. Lieut.-Colonel A. H. Wolley-Dod is spending the year in San Francisco.

GILBERT WHITE. At the bicentennial celebration of the birth of this great naturalist, an address was given by Dr Gilbert White, a great-grandnephew, in which he stated that with the exception of the Bible and the Pilgrim's Progress there had been a greater number of editions of the Natural History of Selborne than any other book.

A SHAKESPEARIAN GARDEN. The Stratford-on-Avon Trustees are endeavouring to fill the Great Garden attached to New Place with old-fashioned flowers so as to make it an Elizabethan garden. They would be glad of plants mentioned by Shakespeare. Plants may be sent to Mr F. C. Wellstood, New Place, Stratford-on-Avon.

PROFESSOR TRAIL bequeathed to the Aberdeen University Library about 2000 books and pamphlets. A list of these, it is to be hoped, will be published in one of the ensuing bulletins of that Library. Professor Trail had a most carefully compiled catalogue of the plant records for the Scottish counties.

COLOURING MATTER OF PLANTS. An important article appears in the ably edited periodical, Nature, for April 1, 1920. It treats of sap-pigments, which are divided into two main classes :—(i) derivatives of flavone or flavinol (anthoxanthines); and (ii) anthocyanins. The former are very widely distributed, occurring in such diverse material as is afforded by heather, clover flowers, onion skins, violas, parsley, &c. The latter, the purples, reds, and blues of plant-life, are noticeable when existing even in very small quantity—one per cent. Indeed the dried flowers of *Centaurea Cyanus* yield only about $\frac{3}{4}$ per cent of the blue pigment, cyanin, whereas the yellow pansy affords 25 per cent. of a yellow sap-pigment. Yet this large quantity is completely masked by the presence of a one per cent. of a plastid carotin. Chemical investigation shows that the blue cornflower owes its colour to the same pigment as that of the red rose. The question is asked—does it raise hopes of success in the endeavour to produce a blue rose? In the rose the colour is red because the sap is acid, in the cornflower the cell-sap can take up enough alkali to form a blue alkali salt. In one of our Floras the flower was actually painted with the coloured sap and is fairly permanent. Reference is also made to dye-pigments. In a couple of pages a mass of highly valuable material has been excellently condensed.

Herbarium of J. Montgomerie Bell. The recent death of our old member, Mr A. M. Bell, whose obitnary notice will be seen on p. 100 recalls the fact that he presented the writer with an Herbarium of about a thousand sheets, which were collected by his brother, John Montogomerie Bell, Writer to the Signet, when he belonged to Prof. J. H. Balfour's Class, 1857-8. Mr J. Bell was born in Edinburgh in 1837 and died there in 1910. The Herbarium contained a few new county-records, which will be found in the *Report*.

Herbarium of John Piquet. An obitnary notice of this octogenarian Jersey Botanist is in the *Report* for 1912, p. 205, and there I alluded to his chief Herbarium being in the possession of his son. In the spring of 1920 I called on Mr Fred Piquet, who was carrying on the pharmacy which once belonged to his father, and to my sorrow found he had just received his death-warrant, as his physician had declared he had malignant disease of the stomach. From this he died a few months after. He wished me to have his father's plants, so I purchased them and found that they included several not mentioned in Mr Lester-Garland's *Flora of Jersey*, as well as a very large number of earlier date than those in the possession of the Société Jersiaise, from which Mr Garland drew much of his material. It also includes a good Moss collection, as well as many of Larbalestier's Lichens.

CORRECTIONS.

Report 1917.

p. 38. Line 23. For " Lappula stipitata " read " Echinospermum stipitatum (Greene as Allocarya)."
p. 97. Line 17. For " Thalspi " read " Thlaspi."
p. 98. Line 22. For " imberis " read " imberbis."
p. 142. Line 5. For " RADCLIFFE " read " RANDOLPH."
p. 253. Line 2. For " Broadfield " read " Bradfield."

Report 1918.

p. 480. Line 28. Insert "*Cystopteris fragilis* Beauv. Finchampstead, *Cope*, 1911; Bray, *Riddelsdell*, 1920."

Report 1919.

p. 554. Line 18. Delete the Polperro locality; the plant proves to be robust *angustissimus.*

p. 573. Line 15. Add "specimen gathered there by A. Grugeon in 1873."

p. 630. Line 20. For "1919" read "1879."

p. 636. Line 11. For "E. Lothian" read "Mid Lothian."

Line 16. For "London" read "Landon."

Line 20. For "Black Loch, Fife," read "Cleish, Kinross."

Line 23. For "with the foregoing" read "Black Loch, Dunfermline."

p. 641. Line 26. For "Bexhill" read "Castle Hill, Hastings."

p. 646. Line 2. For "Cotton" read "Potton."

p. 648. Line 8. For "Haddington" read "Headington."

p. 653. Line 14. For "Lanark" read "Edinburgh."

p. 663. Line 12 et seq. For "Bexhill, Kent," read "Bexhill, Sussex."

p. 666. Line 26. For "Near Bexhill" read "Between Coodens and Norman's Bay, Sussex."

p. 676. Line 13. For "Aberdeen" read "Aberdour, Fife."

p. 681. Line 18. For "T. GREEN" read "H. L. GREEN."

p. 689. Line 17. For "Burntisland" read "Craig Buckley."

p. 689. Line 18. For "Craig Buckley" read "Burntisland."

p. 719. Line 21. For "*paniculatum*" read "*auricomiforme.*"

p. 797. Line 24. The correct name is "*Botrychium multifidum* (Gmel.) Rupr. Beitr. xi., 40, 1859."

SUPPLEMENT TO REPORT OF BOTANICAL SOCIETY
AND EXCHANGE CLUB FOR 1920.

BURSA PASTORIS Weber

(With 9 Photographs in the text).

STUDIES BY

ERNST ALMQUIST, M.D. (Stockholm),

WITH AN INTRODUCTION BY

G. CLARIDGE DRUCE, M.A., LL.D.

INTRODUCTION.

Among the many weeds which followed or were brought by man into Britain we may probably include the Shepherd's Purse, but we possess no information as to the date of its arrival, since as yet no seeds of it have been discovered either in deposits of the neolithic or even in the remains of the Roman period. Our earliest knowledge of it in Britain is to be found in Turner's *Names of Herbs* of 1548, where *Bursa pastoris* is said "to grow by highways almost in every place," and he wrongly says, "whereof is no mention in any olde ancient wryter." Under this name Gerard (*Herbal* 214, 1597), repeats practically the same description of its place of growth, and inserts a wood-block, which already has done duty in Dodoens' *Herbal*.

Its botanical history, however, goes much further back. It is well figured as a cut-leaved plant, the sinuses not reaching to the midrib, the silicles deeply notched with rounded lobes, their sides curved inwards, in the Oxford copy of Dioscorides from the *Codex*

Anicia Juliana,* which dates from the sixth century. A photograph from a collotype copy of the original brush drawing is appended. It is there called *Thlaspi*. Theodericus Dorstenius (*Botanicon* 1540) uses the name *Bursa Pastoris*, Fuchs (*De Historia Stirpium* 611, 1542) calls it *Pastoria bursa* : folia initio exeunt oblongo marginibus profundis incisa, Tragus (*De Stirpium* ed. Kyber 1552) calls it *Bursa pastoris*, as did Matthioli (*Comp.* 1571) and Lobel (*Obs.* 110, 1576), while Dodoens (*Pemptades* 1588) employs *Pastoria Bursa* and his wood block for it was afterwards used by Gerard. In the seventeenth century Caspar Bauhin (*Pinax* 1623) names it *Bursa pastoria*. Tournefort (*Institutes* 216, 1700) keeps the genera *Nasturtium* (*Lepidium*), *Thlaspi*, and *Bursa pastoris* distinct, putting five species under the latter, of which two only are forms of *Bursa pastoris*. Haller (*Stirp. Helv.* i., 217, 1768) unites many Cruciferous genera, including *Bursa*, under *Nasturtium*. Linnaeus unfortunately broke away from old traditions and placed *Bursa* in his genus *Thlaspi*, which included also species of *Aethionema* and *Lepidium*, retaining *Bursa pastoris* as the specific name for the Shepherd's Purse. Hill (*British Herbal* 260, 1756), with his usual acumen, restores the Shepherd's Purse to a distinct genus, and chooses the name in general use, *Bursa pastoris*, which, as he says, "Linnaeus does not keep in a distinct genus, but makes it a species of *Thlaspi*. The seed vessels of the *Thlaspi* are indeed parted by a nick at the end, but they have not the peculiar form of those in this plant which from their resemblance to a pouch or wallet have obtained the herb a name peculiar to itself, and preserved it through most writers," and, as he says, "Bauhin is wrong in making the whitlow grass a species of this genus." Smith (*English Flora* iii., 171, 1824), with Linnaeus and Robert Brown, treats it as a species of *Thlaspi*, a name he says given it by

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*So named from Anicia Juliana, daughter of the Emperor Flavius Anicius Olyber, circa 512 A.D. The drawings were obtained by Angier Guisland de Busbecq, ambassador at Constantinople about 1560, by whom they were taken to Vienna, where he became tutor to the sons of the second Maximilian. There they were preserved until in 1763-1773 Marie Therese had copper-plate copies made by the librarian, Gerhard Sweiten. Four copies were struck off, and the plates were then destroyed. There are two copies at Vienna, one at Oxford with the plant names written in by Jacquin, and a third, an imperfect copy which once belonged to Linnaeus, at the Linnean Library, London. This has only 142 plates ; the Oxford copy has 409. The numbers 1--383 are from the somewhat later Codex Neapolitanus of the 7th century. In 1906 a facsimile copy of the drawings in collotype was made bearing the following title, "Dioscorides. Codex Aniciae Julianae picturis illustratus nunc Vindobonensis Med. Gr. photypice editus. Moderante Josepho de Karabaceck . . . . Lugd. Bat. 1906." It is from this that our photograph is taken.

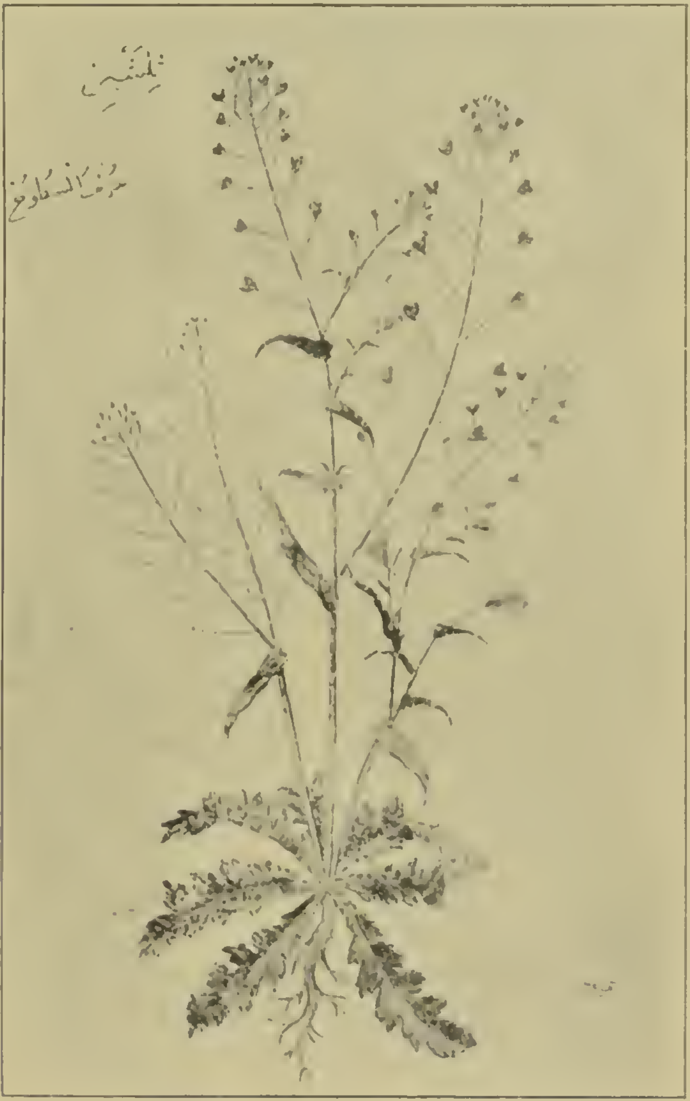

Plate 1.

"Dioscorides, Pliny, and every succeeding writer, though Caesalpinus, book 8, chapters 71, 76 (not book 2) mentions *Capsella* as one of the synonyms in Dioscorides, of which I find no trace. The word indeed is bad Latin synonymous with capsula." Hill's generic name, being of two words, is considered invalid. Weber, however, in Wigger's *Prim. Fl. Hols.* 47, 1780, following Boehmer, established the genus as *Bursa* 503 *Bursa pastoris* = *Thlaspi* L., with the species *pastoris*. He says the Bursas agree with the Thlaspis in having the silicule many seeded, emarginate (and) divided by the style and septum. But the Bursas have the valves boat-shaped (and) naked, while the Thlaspis have the valves winged. (This last is a) good character which ought not to have been disturbed. *Bursa* is very closely allied to *Lepidium*, and might remain with it.

We therefore see that from early times the plant was known as *Bursa pastoris*, that, admitting its claim to generic distinction, Hill was the first post-Linnean authority to put it in a distinct genus, that his compound name being invalid it was definitely established by Weber in 1780, who properly diagnosed it and put a species under the generic name. Therefore when Medicus (*Pflanzeng.* i., 85, 1792) described the genus under the name *Capsella* it was a still-born name, and also had the disadvantage of being, as Smith says, synonymous with capsula. It must have been ignorance or perversity which induced the Congress at Vienna to insert *Capsella* in the list of nomina conservanda, especially as at that time very few species had been described. The name to be used surely is *Bursa pastoris* Weber.

The Shepherd's Purse is, as Hooker says, to be found wherever cultivation extends (*Gard. Chron.* 677, 1875). It is a most prolific seeder and is extremely variable. Caspar Bauhin has three varieties which Dillenius (Ray *Syn.* 306, 1724) says are also found in Britain. These are Bursa pastoris major folio non sinuato C.B.; Bursa pastoris media C.B.; Bursa pastoris eleganti folio instar Coronopi repentis Cam. Hist. 32. Hudson (*Flora Anglica* 247, 1762) adds var. b. B. pastoris minor foliis integris Cels. Upsala 13. Stokes (With. *Nat. Arr.* iii., 707, 1787) notes that it varies in a barren chalky soil, with all the leaves and the stem simple as represented in the last figure of Petiver (*Herb. Brit.* t. 49).

Gray (*Nat. Arr.* ii., 692, 1821) under the name, *Thlaspi cuneatum*, says " varies much in size according to the soil." De Candolle (*Systema* ii., 383, 21) gives the three varieties already mentioned by Dillenius, *i.e.*, *minor*, *integrifolia* and *coronopifolia*. The latter, the plant of Tournefort's *Inst.* 216, is described at length and is represented in Vaillant's Herbarium. Koch (*Syn.*

Fl. Germ. 73, 1837) cites Medikus as the authority for the genus, and gives five varieties:—*integrifolia*, fol. integra: *sinuata*, fol. sinuato-dentata; *pinnatifida*, fol. pinnatifida; *coronopifolia* DC., fol. pinnatifida, laciniis antice incisis; and *apetala*, flores apetali. Babington (*Man.* 31, 1847) attributes the authority for *Capsella* to Ventenat, and says "it varies greatly in the form and divisions of the leaves"; while Hooker and Arnott (*Brit. Fl.* 37, 1855) cite the name as *Capsella* DC.

In 1869 there appeared "A Note on the Forms of the Genus *Capsella*" by Charles P. Hobkirk in *Bulletin Soc. Bot. Belgique* viii., 457, 1869 which, not being of easy access, is here translated with slight abridgment.

For several years my attention has been directed to the differences, which are sometimes very characteristic, presented by the various forms of the *Thlaspi Bursa-pastoris* L., the species which has served to establish the genus *Capsella*. These differences do not appear to be due to such circumstances as the moisture or dryness of the soil, or exposure, because I have noticed these variations in plants growing mixed up together under the same conditions. Having studied very closely the various forms of *Capsella Bursa-pastoris*, I think I am doing a useful thing giving a description of them. The majority of authors have scarcely done more than note the variations in the leaves of the rosette, and, with the single exception of Professor Crépin, not one of them has paid any attention to the formation of the silicle.

With regard to the radical leaves, their shape varies so much even on the same plant that one cannot make use of them; moreover, as these leaves often dry up before the complete development of the silicles, it becomes impossible to examine them on fruit-bearing specimens. But it is not so with the silicle, which always presents fairly well-defined characters that vary only within narrow limits.

Before entering upon the systematic portion of this paper I shall take a glance at what the principal authors have said concerning the varieties, variations or species of the genus *Capsella*.

Many writers notify certain varieties or variations, but not one of them has attempted to define them clearly or to establish their rank.

Jordan (*Diagnoses* 339-342, 1864) is of opinion that *Capsella Bursa-pastoris* is an aggregate type of plant, in which he has been able to recognise five species, *viz.*, *C. agrestis*, *C. virgata*, *C. ruderalis*, *C. sabulosa*, and *C. praecox*.

C. agrestis of Jordan is distinguished by the silicles (pouches) being green, rather narrow, and regularly cuneiform, ending in a moderately open and shallow notch which is not exceeded by the style. The calyx is usually green, slightly edged with white, and the leaves are bright green or sometimes rather greyish.

C. virgata is distinguished by its bright green leaves, its slender habit, its flowers of moderate size, its silicles with a very short and very obtuse notch, which is always exceeded by the style. It is rather late in flowering.

C. ruderalis has deep green leaves, rather small flowers with a green or somewhat brownish calyx, short and broad silicles, in which the notch is scarcely equalled by the style.

C. sabulosa is distinguished by being, under similar conditions, of much smaller size than its congeners, and having smaller leaves. The silicles have a deep notch with oval lobes, rather wide open at the top, but yet much less so than in *C. rubella* Reut. in which the silicle has the lobes of the notch much shorter and not so long as broad.

C. praecox is remarkable by its rather dense fruiting spikes, which lengthen out much less than in the majority of the allied species. The silicles, as well as the stem, often assume a darker hue, the former are triangular with a moderately deep notch, style very short, leaves often but slightly indented, sometimes almost entire, with acute teeth. Stem very leafy. Very early in flowering.

To these remarks Jordan adds ;—"These five species which I have been able to observe and cultivate for several years are not the only ones which are to be found at Lyons, without speaking of *C. rubella* Reut. which is common there. . . . . *C. gracilis*, recorded by M. Grenier, is not a species, in my opinion, but a peculiar state of different species, which is met with more frequently in certain years than in others, and in which the silicles are abortive."

Crépin (*Notes fasc.* i, ii.,) in his own words say :—

"Up to the present time the varieties of this Crucifier have only been founded on the differences in the leaves and on the absence of petals. I am now going to propose three varieties established on the form of the fruit.

Var. α *genuina.* Silicle *narrowly triangular*, its width at the apex *exceeding two-thirds of the height of the dissepiment* ; notch of medium depth, style reaching one-third the height of the lobes.

Var. β *stenocarpa.* Silicle *narrow*, swollen, its greatest width *equalling two-thirds of the height of the dissepiment* ; silicle broader than in the other varieties ; notch shallow, style *usually equalling the summit of the lobes* ; seeds more numerous than in the vars. α and γ.

Var. γ *bifida.* Silicle *exactly triangular* ; notch very deep with the style concealed at the base.

These varieties are met with casually at Rochefort in gardens and cultivated places."

I have made a close study of a large number of forms growing in England, and I have examined those contained in the collections at Kew. None of these forms can be exactly referred to the diagnoses of M. Jordan. This fact, combined with my own observations in nature, leads me to believe that the species defined by M. Jordan are not what are understood under the name of good species, but are merely remarkable forms, sub-species derived from one common type.

It is therefore under the title of sub-species that I am about to describe the various forms of *C. Bursa-pastoris.* As will be seen, I have mainly founded my distinctions on the form of the silicle, and I have almost disregarded the radical leaves.

CAPSELLA BURSA-PASTORIS Mönch.

Sub-species.

1. C. BURSA PASTORIS Mönch (VERA). *C. Bursa-pastoris*, var. *a genuina* Crép.

Sepals ovate-lanceolate, obtuse, green beneath, whitish above, edges widely membranous. Petals white, once again as long as the sepals. Silicle forming an isosceles triangle with straight sides, green on both sides; notch of medium size. style reaching the lower third of the lobes. Pedicels spreading at right angles, once or twice as long as the silicles. Hab.: Common everywhere.

2. C. RUBELLA Reut. Soc. Hall. 18, 1854. Billot *Annot.* 124.

Sepals ovate-lanceolate, subobtuse, reddish underneath, edges narrowly membranous. Petals white, tinged with pink, one fourth longer than the sepals. Silicle forming an isosceles triangle with incurved sides; notch very deep. style much shorter than the lobes. Pedicels ascending, once and a half as long as the silicles. . . . . Spec. in Herb. Kew. S. America. Peru (Matthews): New Granada, etc.; Port Adelaide (F. Müller); Geneva; Tyrol.

3. C. GRACILIS Gren.

Sepals ovate-oblong, reddish at the apex and beneath, somewhat reddish above, edges narrowly membranous. Petals reddish, nearly twice as long as the sepals. Silicle very small, forming an equilateral triangle, sides incurved from the base to the middle, then straight to the apex; notch shallow, style exceeding the lobes which are somewhat reddish. Pedicels curved upwards, three times as long as the silicles. Hab.: Centre and west of France with the two preceding forms: Rhoton (Griffiths): Constantinople etc.

Obs. In the Kew Herbarium there is a specimen with this label:—"*Thlaspi Bursa-pastoris*, var. *microcarpa* Godr. Florul. Inven. p. 8. De Port Juvenal près Montpellier, 8 Juin 1859, J. Gay." This specimen belongs to *C. gracilis*, and may be considered as authentic since it was gathered in the locality named by M. Grenier for his type. In the *Billotia*, 114, 1869, M. V. Bavaux records that in 1863 he sowed *C. rubella* in his garden and that this form established itself and preserved all its characters; only at the end of three years (1866) he found, among plants of *C. rubella* and *C. Bursa-pastoris* growing casually, three specimens of *C. gracilis*. "The appearance of this plant (*C. gracilis*)," he says, "in a locality where it had not shown itself since I possess it (1857), and only when *C. Bursa-pastoris* and *C. rubella* are placed in contact, confirms the opinion expressed by M. Grenier that it is simply a hybrid between these two species." Such also is the gist of the observations made by M. Paillot in the neighbourhood of Besançon. This would explain the frequent atrophy of the seeds of *C. gracilis*.

4. C. STENOCARPA. *C. Bursa-pastoris*, var. *β stenocarpa* Crép. Notes. *l.c.*
C. agrestis Jord.?

Sepals ovate-lanceolate, edges narrowly membranous. Petals once and a half as long as the sepals. Silicle forming an isosceles triangle, its greatest width not equalling two-thirds of the height of the dissepiment: notch shallow, style usually equalling the summit of the lobes; sides nearly straight. Hab.: Rather common in England and probably also on the Continent.

Obs. This form, of which I have seen only English specimens, is more robust than the others, and has longer and broader radical leaves.

5. C. BIFIDA. *C. Bursa-pastoris*, var. γ *bifida* Crép. Notes, *l.c.* *C. ruderalis* Jord.?

Sepals almost as long as the petals. Silicle slightly longer than wide; notch very deep, lobes usually rounded, style concealed at the base of the notch. Hab.: Rather common in the neighbourhood of Huddersfield and between Kew and Richmond; probably generally distributed on the Continent.

Obs. i. The radical leaves and stem leaves are ovate-lanceolate, entire, very rarely slightly dentate.

Obs. ii. I designate provisionally under the name of var. *macrocarpa*, a specimen preserved in the Kew Herbarium gathered in the valley of Kinchungunga (Thibet) by Mr J. E. Winterbotham in 1847 at an altitude of 7500 feet. The silicles are three times as large as in the type, notch very deep, style almost wanting. Perhaps this unique specimen is merely an accidental form.

6. C. HISPIDA.

Sepals almost equalling the petals. Silicles twice as long as broad, sides concave; notch rather deep, style short, not reaching the summit of the lobes. Pedicels spreading, equalling the silicles. Hab.: Orient.

Obs. i. Plant very small, 2-3 inches high, stem bristling with whitish hairs, very rigid, radical leaves pinnatifid or sublyrate, with stiff white hairs intermixed with stellate ones.

Obs. ii. Two specimens of this form are preserved in the Kew Herbarium. One of them bears the following label:—"Col. Chesney Exped. to the Euphrates. No. 43. Port William, March 1836. On Mesopotamia side." The other specimen is labelled:—"Bagdad, April 1862. Dr Schläfi.

Mott in the *Flora Leicester* 16-18, 1886 (see *Rep. B.E.C.* 317, 1915) gives figures of the fruits, and describes eight varieties. These are *gracilis*, *densifolia*, *stenocarpa-lyrata*, *stenocarpa-coronopifolia*, *brachycarpa*, *rubellaeformis*, *macrophylla*, and *bifida*. He says "they cannot be regarded as more than mere varieties . . . they are all linked together by innumerable intermediates and probably no one of them would come true from seed sown under varying conditions" (*sic*). He goes on to say that "Leicestershire specimens do not agree precisely with the descriptions in Hobkirk's Memoir any more than he found specimens agreeing precisely with Jordan's diagnoses, which he thinks indicates that the forms are of a temporary and uncertain character, much influenced by local conditions."

Rouy & Foucaud (*Fl. Fr.* ii. 94, 1893) give seven varieties based on fruit characters. The following is the clavis:—

1.	Silic. sensiblement plus longues que larges au sommet, plus ou moins sensiblement atténuées à la base..	2
	Silic. aussi larges ou presque aussi larges au sommet que longues	5
2.	Silic. profondément échancrées, à lobes dépassant le style..........	3
	Silic. à échancrure peu profonde..	4
3.	Silic. renflées, longuement cunéiformes, étroites, très atténuées à la base ; lobes de l'échancrure oblongs.........var. STENOCARPA Crép.	
	Silic. obcordées-cunéiformes, moins longuement atténuées à la base, grandes (7-8 mm. de long sur 5-6 de large) ; lobes de l'échancrure oblongs.......... ....var. MACROCARPA Albert.	
	Silic. plus petites, obcordées-cunéiformes, peu atténuées à la base ; lobes de l'échancrure ovales..var. SABULOSA (Jord.) R. & F.	
4.	Pétales presque deux fois plus longs que le calice ; style exsert ; silic. relativement larges, obcordées-cunéiformes ....var. RUDERALIS (Jord.) R. & F.	
	Pétales dépassant moins longuement le calice ; style inclus ; silic. assez étroites, régulièrement cunéiformes..var. AGRESTIS (Jord.) R. & F.	
5.	Silic. un peu plus longues que larges, à échancrure profonde et à lobes ovales dépassant beaucoup le style très court..var. PRAECOX (Jord.) R. & F.	
	Silic. aussi larges que longues, à échancrure très courte et très obtuse ; lobes ovales dépassés par le style ; port effilé ....var. VIRGATA (Jord.) R. & F.	

In the text the authors also refer to sub-var *subacaulis*, *canescens*, *coronopifolia* and *apetala*.

In 1897 a plant was found in the market-place at Landau in Germany differing from *Bursa pastoris* in having the silicles elliptical in longitudinal section and circular in cross section instead of flat and obcordate or triangular. It was submitted to Count Solms-Laubach, who was at first inclined to refer it to *Camelina*, and this too was Ascherson's opinion. Cultures, however, soon indicated its relationship to *Bursa pastoris*, and in 1898 several reversions to it were observed. Later Solms-Laubach (*Bot. Zeit.* 58, 167-190, 1900) published the plant as *Capsella Heegeri*. This plant, appearing as it did in so well investigated an area, led De Vries (*Die Mutationstheorie* 477, 1901) to quote it as an instance of mutation. Its original station was soon destroyed owing to the market-place being covered with gravel, but in 1905 Laubert found it along the Dahlem turnpike. Whether this was a second instance of mutation or whether, as more likely, it originated from an unprotected bed where *Bursa Heegeri* was grown at Dahlem several hundreds of metres away is not certain. When *Heegeri* is crossed with *Bursa pastoris* all the offspring resemble the latter, but in the next generation a number of the individuals are pure *Heegeri*, and there are no intermediates.

Lotsy (*Vorles über Deszendenztheorien* pp. 179-181) in 1906 first publicly recognised that *Bursa pastoris* is a compound species, and he showed that three families bred true.

G. Harrison Shull, in a publication of the Carnegie Institution, Washington, No. 112, 1909, gives an account of *Bursa pastoris, B. Heegeri*: Biotypes and Hybrids, the result of his studies. *Bursa pastoris*, he says, has probably been introduced from Europe to North America, but is now completely naturalised and almost universally distributed throughout the North Temperate Zone. (At one time it was cultivated near Philadelphia as a salad.) This species was chosen by Dr Shull for pedigree culture on account of its well-known and strikingly polymorphic character, its hardiness, ease of culture, and the impossibility of its having been subjected to any of the artificial conditions of isolation, crossing, etc., which are usually thought to render plants of economic value unfit to give information regarding the behaviour of plants in nature. The cultures were begun in April 1905 and continued till 1907. In one group plants of the fourth generation and a few of the fifth have been under observation. Dr Shull finds that while certain variations which were selected disappear in the first or second generation, others remain constant, and show easily recognised differentiating marks except in one form, and no transgression of the characteristic features of any other forms studied. These forms are therefore distinct elementary species or biotypes, each characterised by certain constant features and each with its own normal range of fluctuating variability. Dr Shull is content with naming four elementary species whose distinctiveness and permanence he has demonstrated beyond doubt, their hybrid combinations having also been carefully studied. He had under observation twenty pedigreed families, including 26,900 individuals of *Bursa pastoris*, two small families of *B. Heegeri*, and five families representing reciprocal crosses between these two species, and involving over 2,500 individuals. All the cultures were under glass. The seeds, which germinate in five to eight days, were sown in sterilised soil, and grown in three or four inch pots. The flowers are adapted to both cross and self-fertilisation, the latter being most effective.

s than one per cent. of the plants raised from wild seeds showed
dence of crossing between different biotypes. Of the twenty-one
ginal cultures two proved to be of hybrid origin. Self-fertilisa-
n takes place before the petals spread so it is necessary to remove
stamens about a day before the buds open. The four pure
types described are mainly distinguished from each other by the
racteristic lobing of the leaves. He names these BURSA PASTORIS
TERIS, TENUIS, RHOMBOIDEA and SIMPLEX. HETERIS has the
ves divided to the midrib, the terminal lobe being usually sepa-
ed from the nearest lateral lobes by deep, clear-cut incisions.
e lateral lobes consist essentially of two features—an elongated
enuate portion, "the primary lobe," and a more or less rounded
angular portion, "the secondary lobe" in the distal axis of the
mary lobe. The descriptions are taken from the climax leaves
ce the young leaves of all the species are unlobed. (See Lubbock
Seedlings I, 166.) TENUIS. In this the sinuses are relatively
llow, rarely extending nearly to the midrib in the strongly de-
oped individuals. The terminal lobe is not separated from the
rest lateral lobes by deep, clear-cut sinuses. All the lateral lobes
d to be more or less slender, elongated and acute. RHOMBOIDEA.
ke *heteris* this has the leaves undivided to the midrib and pos-
ses a similar, more or less rhombic, terminal lobe set off by deep
uses from the nearest lateral lobes. The terminal portion of the
eral lobes has, in well-developed specimens, a nearly rhombic
m. SIMPLEX. This resembles *tenuis* in that the sinuses never
ch the midrib but differ in having mostly simple, rounded or tri-
gular, acutish, unincised lobes, not attenuate.

Thus we see: (1) That from priority of publication and
onsistent usage by the majority of botanists for nearly three
turies the correct generic name is BURSA. This was adopted in
E. Brown's *Suppl. to English Botany* and by Groves in his
ition of Babington's *Manual*, &c. (2) That *Capsella* is of later
te and in its formation transgresses a botanical rule. (3) That
m early times the variability of the Shepherd's Purse has been
served. Such early writers as Caspar Bauhin and Dillenius had
ee segregates and their views were followed by De Candolle and
épin. Jordan describes four species, Hobkirk six sub-species,
tt nine varieties, Rouy & Foucaud seven varieties and four sub-

varieties, and Shull four species. Almquist later names sixty-five elementary species. Hobkirk and Rouy base their characters on the fruit and flower, Shull, on those derived from the leaf, and Mott, on fruit, flower and leaf-characters.

Another variety, *parvula* Beck., is also included in my *List.* Records, too, of *C. gracilis* Gren. and *C. rubella* Reut. have been made for Britain but it is highly probable that in the former case plants with abortive capsules or even hybrids have been mistaken for Grenier's plant which some botanists assert is itself a hybrid of *B. pastoris* and *rubella*, while no authentic evidence exists as to the occurrence of the latter in Britain.

It has been customary to ignore the variations of *Bursa*, and statements, often very dogmatic, have been made on the plasticity of these plants which are said to be influenced by soil and exposure. There has been no scientific evidence brought forward to uphold these pronouncements. Soil and exposure, as with other plants, influence the size of the Shepherd's Purse, but we lack precise information as to their influencing the fruit form.* It is quite certain that we have several forms which breed true and recent careful experiments go to prove that these are micro or elementary species at least on the level with many Hieracia, Cochleariae or Euphrasiae.

We are indebted to Dr Ernst Almquist for his most painstaking experiments, the results of which were published in the *Act. Hort. Berg.* for 1907. Here he supplies 65 photographs of as many elementary species which he has cultivated. He grew 206 gatherings from Sweden and 164 from other parts of Europe, 4 being from England. His experiments were conducted in the open air, with the plants unguarded, for usually two to four generations, and he states that after this length of time the cultures had either died out or were no longer pure, owing he thinks to crossing with other elementary species. We are now indebted to him for the following descriptions of the species which he has since cultivated.

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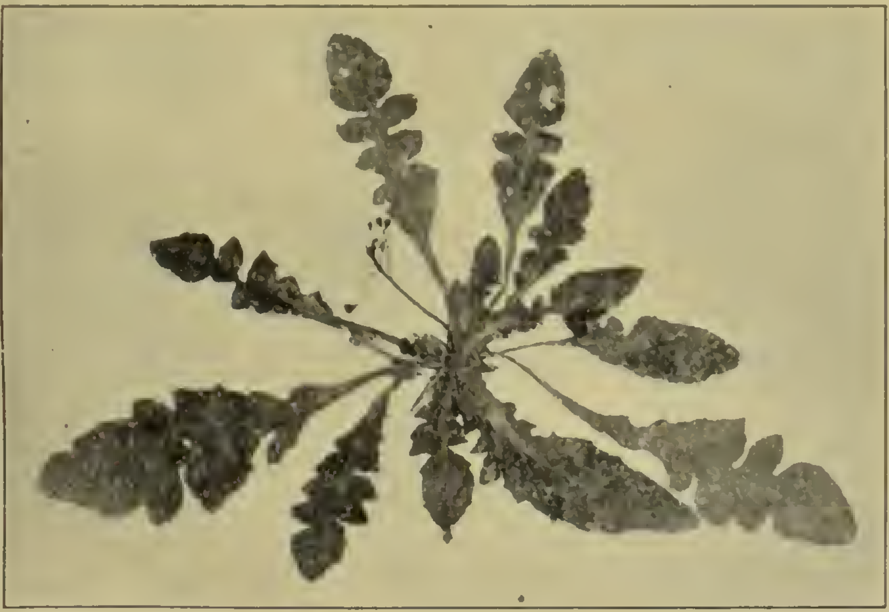
* For instance, Timbal Lagrave (*Gard. Chron.* 379, 1874) alleges that "in particular spots *Bursa* does not vary; elsewhere under climatal conditions the plant becomes dwarfed." He says "if sufficient heat, light, and moisture are present the stem grows rapidly, flowers produce seed; but if these conditions are deficient and the weather cold, the plant remains apparently stationary. But during the apparent arrest the stems may assume different direction, the seed-pods another form, so that a different habit ensues; also difference of tint is induced by variation in temperature or by alterations of light, moisture, or heat."

THE ENGLISH CAPSELLA BURSA-PASTORIS (L.).

ERNST ALMQUIST, M.D. (Stockholm).

Studies of *Capsella B.-p.* are difficult and demand much time.
rst it is necessary to enquire whether in the great confusion of
rieties constant species really are to be found. This question I
ve already cleared in 1907. Among 370 races from different coun-
es I was able to find at least 70 species that remained constant in
lture during two or three generations. At present I have pub-
hed descriptions of 200 constant forms.

Then it is quite necessary to find out the series of forms for each
ecies. For this purpose cultures are absolutely essential. Really



Reduced ½.

Plate 2. C. ANGLICA ; October : rosette, end lobes cuneatiform.

ost of the species pass through a whole series of forms, partly de-
ending on the soil, climate and other exterior relations, as for
stance in the size of leaves and fruits, the height of the stem and
e number of branches. But most of the differences within a species
epend on the inbred qualities. Some species, especially those that

are small and low, have always the same form of capsules and leaves. Very often, however, the capsules are different in the spring, summer and autumn. The differences concern the length and form of the capsules, especially the notch. In hot summers the length may be considerable, in the autumn the notch often is deeper. The differences are sometimes very striking and culture alone can prove the affinity. The leaves also show great differences. In the autumn the same species is able to produce rosettes both with entire and pinnatifid leaves. The same rosette can in spring show first very narrow lobes, then broad, and at last entire leaves.

In spite of all variation the described species are quite constant each passing through its own special series of forms. Exact and extensive observations are needed for describing a new species. If in a country most of the forms are known I think the other species can be studied without troublesome cultures.

As a rule it is very difficult to recognise a species by reading the description only. One needs to examine original specimens. *C. rubella* and *C. grandiflora*, however, are easy to recognise. The former is very common in the Mediterranean countries. Only the long capsules in the summer and the hybrids present diagnostic difficulties. In my cultures these often originated, and in the museums one finds similar forms, likely hybrids, labelled *C. rubella*. *C. grandiflora* ought to be easily recognised by its long petals. In spite of this character, however, the question is not so simple. I have cultivated seeds from several botanical gardens and also from wild individuals, and I have got rather different plants, all with long petals, but not showing similar capsules. I have instances from Triest, Kew and Edinburgh. I suppose that hybrids have originated.

Jordan cultivated at Lyon and described five constant species. As the *Capsella* flora of the Rhône is unknown to me, I cannot with certainty know if among my 200 species I have included some of Jordan's forms. His descriptions, however, are rather detailed, even the length and the breadth of the capsules being mentioned. But I chiefly miss any statement concerning the lateral margins, if straight, convex or concave. Nevertheless I will try to place them together with my own species in the following statement.

Crépin discerned at Rochefort three varieties according to the form of capsules: v. *genuina*, v. *stenocarpa*, v. *bifida*. Hobkirk calls them sub-species and completes the descriptions without regard to

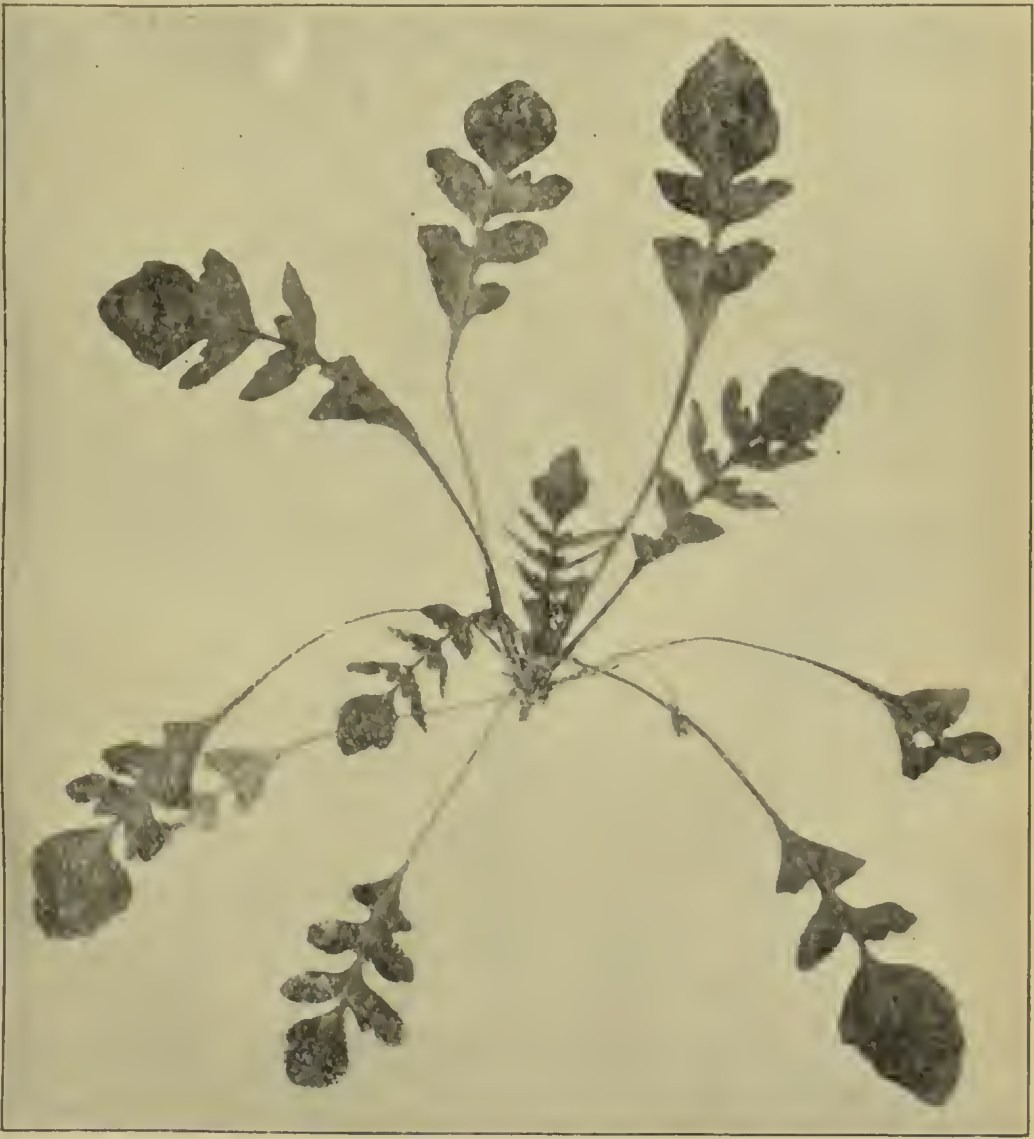


Plate 3. C. ABSCISSA; October; rosette with lobes, first incised at the base, then kyphotic and almost filiform.

the leaves. Hobkirk has the merit of pointing out the diagnostic value of the different lateral margins. It seems to me that his subspecies are arbitrary types rather than species. So *C. genuina* embraces almost all Capsellas with straight lateral margins and moderate depth of the notch, whatever is the form of the leaves, &c.

Taking into account both leaves and capsules Mott found " among a considerable number of specimens collected in this county the following extreme forms sufficiently distinguishable, while the rest run in between them with a complexity of cross characters, which defies classification." Mott gives a cut showing 7 forms of capsules and describes 8 varieties (*Flora of Leicestershire* 1886).

Through Professor V. B. Wittrock I have received seeds of Capsellas from some British Botanical gardens. Dr G. C. Druce has several times sent me dried specimens, and Mr C. E. Britton has also sent excellent collections from Surrey. Both gentlemen kindly assisted me with the literature. In this way it has been possible for me to deal with the British Capsellas.

I give here the descriptions of 18 species of *Capsella B.-p.* Two of them are new and 16 were described before in *Acta Horti Bergiani* 1907 and 1921.

I hope that my little study may be well received and may increase the interest in this neglected plant and that it will soon be followed by investigations of all the British forms of *Capsella B.-p.*

METHOD.

For the description of a species I use only one race, but mention the others that are related as " similar forms." They may be identical, but I have not cultivated them long enough to be quite sure. The description of the capsules concerns the ripe fruit (*Rep. B.E.C.* 324, 1915; 490, 1918). I seldom mention if a species has medium size of stem or leaves, if the rosettes do not bud in autumn, if petals exist, and other qualities that as a general rule belong to almost all Capsellas. Lastly I wish to remind the reader that the cultivated and the wild Capsellas are quite the same. For the methods of cultivation I refer to my two former pamphlets.

TERMINOLOGY.

Caulis bifida = stem and branches almost of the same size.

Caulis foliosa = stem uncommonly rich in leaves.

Silicula scoliotica = lateral margins scoliotic, oblique.
Silicula cardiaca = cardiac form of the notch.

Folium cuneatum = the point or terminal lobe cuneatiform (Plate 2).
Folium kyphoticum = the lobes kyphotic, gibbous (Plate 3).
Folium lunulatum = the lobes lunulate (Plate 4).

ABBREVIATIONS.

Sa. = individuals germinating in spring or summer, fructiferous the same year.

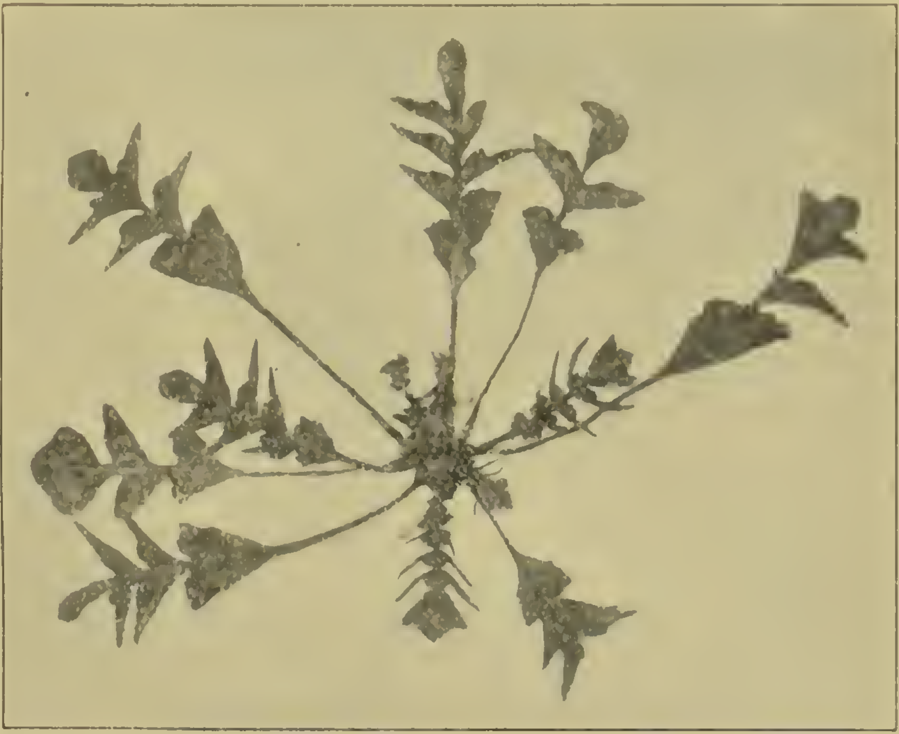


Plate 4. C. RHENANA ; October : rosette with lunulate lobes, at last kyphotic, filiform.

[This will be described in next year's Report.]

Wa. = individuals germinating in autumn or summer, fructiferous the next year.
Wr. = rosette that remains through the winter.
8 x 6, &c. = capsules 8 mm. long, 6 mm. broad.

H.B. = Hortus Botanicus.
Spont. = spontaneous, not cultivated, wild.
I. and II. = my pamphlets 1907 and 1921, mentioned above.
Classes I.-XII. = the class where the species is inserted in my pamphlet 1921.

Regarding the photographs it may be observed that in the Swedish climate the capsules from June belong to wa., from July and August to sa. They are all, with the exception of Plate 2, which is reduced $\frac{1}{2}$, reproduced in the natural size.

DESCRIPTION OF THE SPECIES.

I. Capsules very convex; notch mostly deep (except *C. laevigata*)

CAPSELLA B.-P. (L.) MEDITERRANEA E. At. (II. p. 87, class XII.). (Plate 5.)

Radical leaves of medium size, sinuate, usually pinnatifid; lobes broad, often kyphotic, not seldom very narrow and acuminate; stem leaves mostly entire, indented; leaves sometimes very hairy; stem firm, branched, foliosa, bifida; capsules 8-9 x 6 or 7-8 x 5-6, the form changing; wr. numerous, in my cultures usually not budding, pinnatifid; lobes broad, soon kyphotic, then very narrow; terminal lobes hardly ever cuneatiform.

In the environs of Cannes, very common. Similar form from Rouen, H.B. and different places in Surrey, C. E. Britton. Jordan previously cultivated at Lyon a species, *C. praecox*, that possesses a great many of the distinguishing features of *C. mediterranea*, even the brown spots on the stem and elsewhere; capsules 7 x 6. It is probably the same form.

CAPSELLA B.-P. (L.) BATAVORUM E. At. (II. p. 88, class XII.). (Plate 5.)

Leaves entire, sinuate, often pinnatifid, with rather triangular lobes; stem low, bifida; stem leaves scarcely indented; capsules 5 by 4, sometimes 7 x 5-6; wr. small, often budding, entire or sinuate, finally pinnatifid with broad lobes, the terminal often cuneatiform.

It differs from *C. mediterranea* in all its parts being smaller, and in the leaves being much more entire. I have never seen long, thin lobes. In culture both species are constant. I do not know all the forms of them, and am therefore unable to recognise all individuals that belong to this group.

Cultivated from Leyden, Liege and Paris. Similar plants from Zurich, and from London, Surrey, Oxford, and other places.

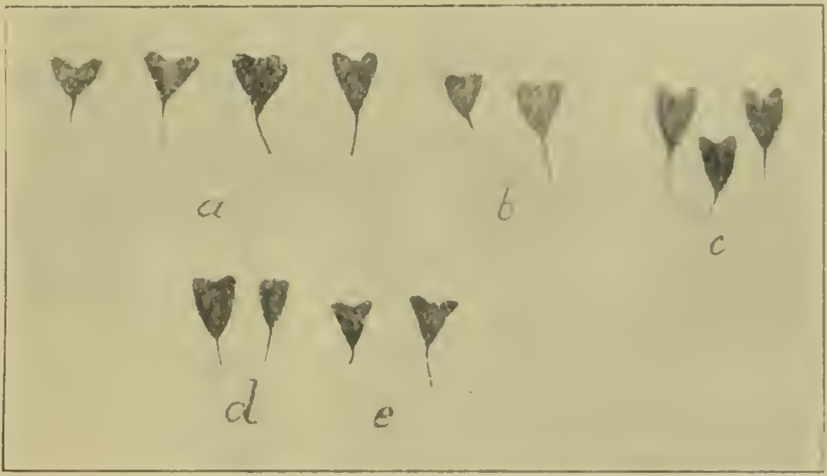


Plate 5. *a*—C. MEDITERRANEA ; January bis spont., June, July.
b—C. BATAVORUM ; July, June.
c—C. BRITTONII ; July, September spont., June spont.
d—C. LAEVIGATA ; August, July.
e—C. SEMIRUBELLA ; August spont. bis.

[St Brelade's, Jersey, 1919, Druce; Bournemouth, S. Hants, 1905, Miss Palmer; near Kingston, Coombe Park, Surrey, Britton (as *brachycarpa*); Coombe Lane, Surrey, Britton (agrees with *agrestis* Jord.); Acton, Middlesex (as *densifolia*); near South Park Road, 1905 [O. 815]; site of aerodrome, Oxford Parks [W. 20], (as *macrocarpa*); Woodstock, Oxon (as *agrestis*), and Steeple Aston (as *bifida*); Hardingstone, Northants, 1873, Druce; Humberstone and Scraptoft, Leicester, Horwood [B. 17] (as *brachycarpa*) and [B. 18] (as *densifolia*), see *Report* 1915; Aberdare, Glamorgan, 1912, Riddelsdell, see *Report* 1912; Millers Dale, Derby, 1907, Druce; Barrow-in-Furness, Lumb, see *Report* 491, 1918; Edinburgh, Arbroath, Forfar, 1915, Druce. A somewhat remarkable point connected with the above is that the O. 815 gathering from the wall near South Parks Road, adjoining the Parks, was made in 1905, that of

W. 20 was from close to the same place in 1919. An aerodrome had been built on the site and after its removal the ground was covered with a mass of Shepherd's Purse of the same form, *batavorum*, which grew close to the spot fourteen years before. It may be added that the Hardingstone specimen was named by Mott as his *brachycarpa*. Mr C. E. Britton also has it from West Barnes [1961]; Cottenham Park, Wimbledon, Surrey, and Hayes Common, W. Kent.]

CAPSELLA B.-P. (L.) LAEVIGATA E. At. (II. p. 81, class X.). (Plate 5.)

Leaves broad and long, entire, sinuate to pinnatifid, with long, broad, triangular lobes, sometimes indented; stem firm, high, foliosa. mostly branched upward; capsules broad, convex, with the lateral margins rather parallel, notch usually shallow, sometimes deeper. with rounded lobes, 7-8 x 5-6 or 6-7 x 7-5.

In all parts larger than the following.

Cultivated from the environs of Stockholm, North Sweden and Finland. C. E. Britton has, as it seems, sent the same beautiful form from Surrey. Similar forms also from Treves and Cannes, but probably not identical.

[New Malden, Surrey [1965], see *Report* 489, 1918; Molesey [573], Merton, Surrey [1947], Britton; Chute, Wilts, Druce; Narborough, Leicester, Horwood.]

CAPSELLA B.-P. (L.) BRITTONII E. At. (II. p. 87. class XI.). (Plate 5.)

Leaves sinuate to pinnatifid; lobes long, broad, acuminate, at the base sometimes incised, but scarcely indented except in autumn; stem rather short, firm; capsules long, very convex, 7-8 x 7-5, notch deep. lobes ± acute.

C. E. Britton sent many individuals from Surrey, and I have cultivated several of them. I have also cultivated similar forms from Riga and Reval, and received specimens from Zurich, Brussels and Cannes.

[Castle Hedingham, N. Essex, 1915 [O. 802], Druce. This struck me at the time as distinct and Britton thought although "allied to *agrestis* it seemed to merit an appropriate name" which it has now received. Chute, S. Wilts, 1915, Druce (as *densifolia*);

Lighthorne, Warwick, Miss Palmer: Banbury, Oxon; Middleham, W. Yorks, 1916, Waterfall; St Cyrus, Kincardine, 1916, Druce; Furness Abbey, 1918, Lumb. The first was thought to be *stenocarpa-lyrata*, the second from Abbey Road, *densifolia*, see *Report* 190, 1918. Haroldswick, Unst, 1865, Tate. Mr C. E. Britton has it from the side of a path, Blue House, Merton, Surrey, 1891, see *Report* 489, 1918, and West Barnes, Surrey. Narborough, Leicester [B. 1], Horwood (as *stenocarpa-coronopifolia*), see *Report* 523, 1915.]

II. Capsules broad, forming an isosceles triangle, lateral margins rather straight.

Capsella B.-p. (L.) Druceana E. At. (II. p. 51, class I.). (Plate 6.)

Radical leaves broad, usually entire, pedicels rather long: stem leaves a little indented; stem firm, bifida, foliosa: capsules short, broad, 7-8 x 6-7, lateral margins tolerably straight, notch deep, lobes divergent. They are before ripening concave, often oblique. Some individuals have the capsules rather convex. Wr. large, budding, leaves broad, entire, elliptic with long pedicels, soon ± deeply incised; end lobes scarcely cuneatiform.

Cultivated from Oxford and Surrey, also from H.B. at Edinburgh, Leyden, Louvain and Hamburg.

The sub-species *C. bifida* of Crépin and Hobkirk has capsules like those of *C. Druceana*, but the leaves are not described. Mott's v. *bifida* seems to be the same form as mine, also the leaves are similar. In my cultures from one individual I observed capsules of different forms, the lateral margins straight or convex, like v. *macrophylla*. I possess forms with broad capsules and straight margins, at the same time with large leaves. The capsules belong to v. *bifida*, the leaves perhaps partly to v. *macrophylla*. I think that *C. Druceana* embraces at least a part of the last form. Also I believe v. *rubellaeformis* may partly belong to *C. Druceana*. *Cf. Rep. B.E.C.* 319, 322, 1915.

My species, *C. cuneifolia*, from Antwerp was cultivated for four years. The wa., that is the wr. and the individuals in spring, seem to be clearly different from *C. Druceana* as the end lobes are cuneate.

the capsules narrower, 7-8 x 5-6, and the lateral margins straight. The sa. seem to be rather conformable to *C. Druceana*. I cannot draw any limits. Perhaps I shall be able to find them in continued cultures. Perhaps also more species exist in this group.

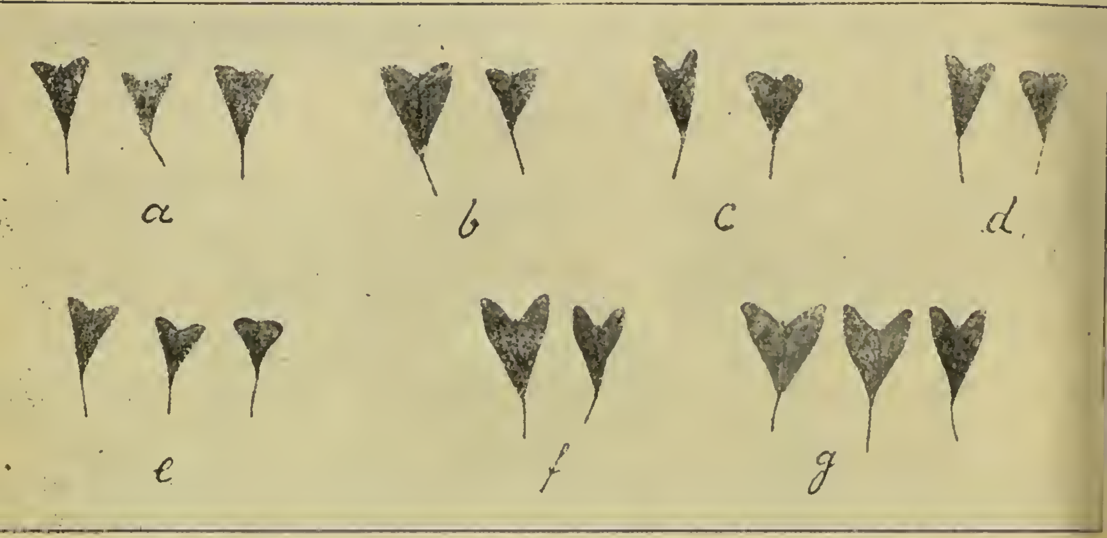


Plate 6. *a*—C. CONCAVA ; September, July, June.
b—C. DRUCEANA ; July, June.
c—C. PROVINCIALIS ; July, June.
d—C. ANGLICA ; August, June.
e—C. RUBELLA ; July, June, March spont.
f—C. PATAGONICA ; July.
g—C. SCOLIO-CASPICA ; July bis, June.

[This is an excellent and very remarkable species, and apparently the most common in Britain. The original specimen sent from Oxford has been cultivated since 1916. It is represented in *Herb. Druce* from Noirmont, Jersey, 1851, Piquet; Castle Hedingham, N. Essex, 1915, Druce; West Barnes, Merton, 1919, Britton (as *macrophylla*); Frogmore, Berks, 1895, Druce; Botley, Oxford Bot. Gard. [933], (as *bifida*), (thought by Mott to be not quite typical *bifida* but approaching *macrophylla*); Steeple Aston, 1897; my own garden at Oxford [O. 951] (as *bifida*) and [O. 801] Oxford Botanic Garden, a macrophyllan form, see *Report* 1915. This has persisted for thirty years. Hailey, Binfield, 1882, Druce; Kings Weston Down, West Gloster, White (as *bifida*), see *Report* 1890: Humberstone [B. 4, B. 14, B. 20] as *rubellaeformis*, [B. 9, B. 19] as *bifida*, [B. 7] as *brachycarpa*, [B. 18] as *densifolia*, [B. 6] as *stenocarpa-lyrata*, Leicester, Horwood: Leicester (as *rubellaeformis*) [15], Wade; Myton, Warwick, Bromwich (as *integrifolia*); Kirkby, S. Lancs, Wheldon (as *agrestis*), see *Report* 319, 1915; Walton, 1913, Wheldon (as *integrifolia*), see *Report* 452, 1913; garden-weed, Dalton-in-Furness, 1915, Lumb, referred to *bifida* in *Report* 319, 1915; Wigginton, Oxford, Riddelsdell, see *Report* 319, 1915; 588, 1916. Mr C. E. Britton has it from many localities in Surrey, *e.g.*, Merton [1923], Molesey Hurst [571], and West Barnes [1963], see *Report* 489, 1918.]

III. Capsules concave or oblique.

CAPSELLA B.-P. (L.) CONCAVA E. At. (I. p. 12; II. p. 51, class I.). (Plate 6.)

Radical leaves broad or narrow, entire, sinuate, sometimes indented or pinnatifid, lobes often kyphotic; stem firm, usually low, bifida, foliosa; wr. numerous, often budding, the leaves as mentioned, the end lobes often cuneate; capsules 8 x 6, always concave and attenuate at the base, notch moderate, very open.

Cultivated from Portugal, South Italy, California and Parana. Specimens from New Malden, Surrey, gathered in May (Britton), have small but concave capsules. From the seeds I got rather typical *C. concava*.

It is likely that Mott partly describes this species as v. *rubellaeformis*. *Cf. Rep. B.E.C.* 322, 1915.

CAPSELLA B.-P. (L.) REUTERI E. At. (I. p. 19; II. p. 53, class I.).

This species from Besançon, H. B., agrees with the well known *C. rubella* Reuter, but has entire or sinuate leaves and is not spoiled by frost in winter. The form of the capsules, the small petals and small seeds distinguish these species from all other Capsellas. Capsules 6-7 x 5-6; sa. longer; wr. not budding.

G. C. Druce has sent me a few small individuals with similar capsules and leaves, but it seems that the petals are a little longer. They were collected in the cobblestones in front of houses at S. Zeal in Devonshire in August 1919, by the Rev. H. E.

Fox. I also possess a similar form from London, N.W. It is possible that they belong to *C. Reuteri* or to some hybrid of *C. rubella.* If true, it is interesting, so much more as C. E. Britton has not seen any form from Britain that he would refer to Reuter's species (*Report* 322, 1915). In the museums I have seen different forms labelled *C. rubella* that probably are hybrids.

CAPSELLA B.-P. (L.) PATAGONICA E. At. (II. p. 52, class I.). (Plate 6.)

Leaves rather small, pinnatifid, often incised or kyphotic, sometimes sinuate and indented; stem not high, slender; capsules very scoliotic, concave, up to 9-10 x 6-7, notch deep, lobes long; wa. capsules smaller, from 6 x 6 to longer, notch shallower; wr. numerous, not large, seldom budding, leaves pinnatifid, lobes a little rounded, kyphotic, end lobes scarcely cuneate.

Cultivated from Patagonia (Dusén); similar forms also from Cannes and H.B. at Strassburg and Nantes, and in Italy and Portugal. One similar specimen also from Wigginton, Oxon, 1916, H. J. Riddelsdell.

Jordan's species, *C. sabulosa*, cultivated at Lyon, perhaps belongs to *C. patagonica.* The characters agree—capsules 5-6 x 5, in the lower parts being very narrow, lobes oval and leaves small.

C. provincialis E. At., from Cannes, agrees with this species, but the capsules have slight convex or straight lateral margins, 8-10 x 6.

CAPSELLA B.-P. (L.) ANGLICA E. At. (II. p. 52, class I.). (Plate 6.)

Radical leaves rather narrow, sinuate or pinnatifid, incised and indented, with broad, obtuse lobes; pedicels short; stem firm, of medium height, bifida, foliosa; capsules a little concave and scoliotic, up to 10 x 6, wa. 7 x 6, lateral margins almost straight, notch shallow, cardiae, with rounded lobes; wr. large and numerous, often budding, leaves already described, end lobes often cuneate; in the spring pinnatifid with narrow, kyphotic lobes.

Cultivated from H.B. at Cambridge and from Brussels, where I found the same form. Similar forms also cultivated from H.B. at Rouen and Leyden, lastly from Oxford (Druce), and London.

This species I have not found in literature. *C. Druceana* has broader capsules, with deeper notch, not attenuate at the base and the leaves have a tendency to form rather broad ellipses with rounded ends and long pedicels. *C. anglica* has leaves often elongated to acute, pointed at both ends; capsules a little scoliotic.

[Hailey [O. 995], Botley [O. 817], Hort. Oxon. 1913 (named *bifida* by Mott); Tenby, Pembroke, Druce; Humberstone, Leicester, Horwood (as *cuneata*); Wimbledon Park, Hook, Surrey [193], Britton.]

CAPSELLA B.-P. (L.) TURONIENSIS E. At., n. sp. (class II.). (Plate 7.)

Leaves entire, indented or sinuate, ± incised but seldom pinnatifid, lobes often acute; stem low, slender, somewhat branched: capsules 7-8 x 5-6, lateral margins rather scoliotic, a little concave or convex, with the lobes partly jutting out, notch open and shallow; wa. shorter, perhaps less oblique; wr. very small, sometimes budding; leaves entire, not acuminate, incised, a few partly pinnatifid.

Cultivated from H.B. at Nantes and Tours. Similar form also from Ghent.

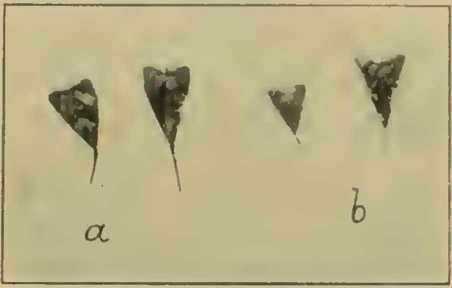


Plate 7. *a*—C. BELGICA; June, July.
b—C. TURONIENSIS; June, August.

The capsules are smaller, the lobes of the notch more acute and the lateral margins more convex as in *C. anglica*. G. C. Druce has sent small specimens from Hertford, Surrey, and Watton, Norfolk, that perhaps belong to *C. turoniensis*, but possibly they are only small forms of *C. anglica*. The leaves are partly pinnatifid, lobes indented and incised. Generally *C. anglica* is much larger.

[Pyrford, Surrey, 1913, Druce; Humberstone, Leicester, 1915 [B. 5], Horwood.]

Capsella B.-p. (L.) belgica E. At., n. sp. (class II.). (Plate 7.)

Radical leaves entire and sinuate or pinnatifid; lobes broad, acuminate, denticulate: stem leaves partly broad in both the mentioned forms; stem not high, very branched, bifida, foliosa, a little slender; capsules scoliotic, rather convex downwards, thin, notch shallow, 8-9 x 5; wr. large, numerous, lobes broad, then rather narrow, acuminate, very toothed, partly kyphotic.

This good species I found at Brussels and Treves. It is likely to be found in England.

Capsella B.-p. (L.) semirubella E. At. (II. p. 59, class III.).

Radical leaves pinnatifid, lobes acuminate, kyphotic or lunulate; stem of medium size, weak or firm, low specimens in autumn; wr. numerous, lobes as mentioned; stem leaves toothed; capsules scoliotic and concave, notch shallow, cardiac, 8 x 5-6, in the autumn 6 x 5, notch deeper (Plate 5).

From Moerstrand, on the west coast of Sweden. Similar forms from Bremen and Brussels. Especially in autumn they are similar, but in the other seasons the capsules are 6-7 x 4-5, and the leaves are often lunulate. This should be looked for in England.

IV. Capsules small, narrow, notch shallow or absent, lateral margins rather straight.

Capsella B.-p. (L.) gallica E. At. (I. p. 74; II. p. 64, class IV.). (Plate 8.)

Radical leaves pinnatifid, with acuminate lobes, often " short, closely pinnatifid in a dense rosette; " stem leaves rather numerous, incised, pinnatifid or entire; stem usually low, firm, bifida; capsules 6 x 4, notch shallow, cardiac, lateral margins straight or convex; wr. numerous, usually small; lobes broad, then narrow and incised or kyphotic.

Cultivated from Lille, H.B. C. E. Britton has sent from Merton, Surrey, several specimens, partly labelled v. *densifolia*, that belong to *C. gallica*. I have cultivated some of them—sa. capsules 6 x 5, leaves rather entire. Similar forms also from Middleham, W. Yorks, 1916 (Charles Waterfall), and from Hevington (A. R. Horwood).

Mott's v. *densifolia* and v. *brachycarpa* may both, at least partly, belong to *C. gallica*; also Jordan's *C. virgata*—capsules 5 x 5.

[St Helier, Jersey, 1906, Druce; Coverack, Cornwall, 1910, Rev. H. E. Fox (referred by me to *densifolia*, by Marshall to *cuneata*); Ridgeway, Berks, 1895, Druce; Merton, Surrey, Britton (as *gracilis*); Oxford, 1898, Druce; Kibworth, Leicester, Horwood (as *stenocarpa-coronopifolia*) and [No. 1924] as *densifolia*; [B. 26, B. 35], Edinburgh, Druce; Middleham, W. Yorks, 1916, Waterfall. Mr C. E. Britton has it from West Barnes, Surrey [1942 A.]; Boxted, N. Essex [1084], G. C. Brown, see *Report* 558, 1916.]

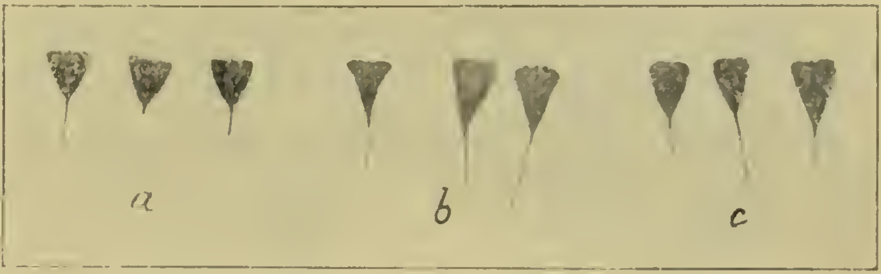


Plate 8. *a*—C. GALLICA; May spont.
b—C. ABSCISSA; October, August, June.
c—C. BREMENSIS; June.

CAPSELLA B.-P. (L.) BREMENSIS E. At. (I. p. 34; II. p. 71, class VI.). (Plate 8.)

Pinnatifid or sinuate; lobes triangular or narrow, incised and kyphotic; stem firm, bifida, branches long; capsules 6-7 x 4-5, notch almost absent, lateral margins rather straight; wr. numerous, leaves as mentioned.

From Bremenhaven cultivated, often apetalous. From Brussels, Treves and Ghent similar forms, with petals. W. H. Pearsall found the same in Dalton-in-Furness, see *Report* 210, 1917, and C. E. Britton in Surrey.

Mott's v. *gracilis* seems related, perhaps also Crépin's v. *stenocarpa* and Jordan's *C. ruderalis* from Rhône—capsules 7 x 5.

[Slapton Sands, S. Devon, 1916, Druce; Stainton, S. Lancs, Pearsall, in *Report* 480, 1918.]

CAPSELLA B.-P. (L.) ABSCISSA E. At. (II. p. 71, class VI.). (Plate 8.)

Pinnatifid, lobes long, acuminate, narrow until almost filiform, kyphotic, sometimes lunulated, in the spring partly entire; stem very branched, partly bifida; capsules 6-7 x 4-5, concave, notch none, often rounded on the top and the lobes jutting out; sa. capsules sometimes longer, cuneiform, notch shallow; wr. numerous, often budding, lobes soon narrow, indented.

From Berlin and from Utrecht, much cultivated. Also from Lille. Charles Waterfall found a similar form in Middleham, Yorks, 1916, and C. E. Britton in Surrey.

CAPSELLA B.-P. (L.) TREVIRORUM E. At. (I. p. 76; II. p. 71, class VII.). (Plate 9.)

Leaves pinnatifid; lobes narrow, acute, kyphotic to lunulate; stem of medium size, long, weak, branched; capsules 7-9 x 4-5, slightly convex, notch shallow, cardiac; wr. few, dying through frost in the Swedish winter.

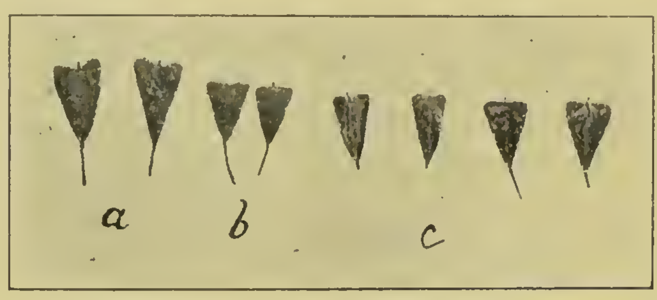


Plate 9. *a*—C. TREVIRORUM : July.
b—C. GERMANICA ; July, June.
c- C. VIMINALIS ; June, July.

Cultivated from Treves and Lorraine. Similar forms from West Barnes, Surrey (C. E. Britton), and other places in England.

[Abingdon, Berks, Druce, see *Report*, 1915, where it was confidently referred to Mott's *densifolia*; Chute, Wilts, 1915 [O. 931]. Druce; Slapton Sands, S. Devon, 1916 [P. 1727], Druce.]

Mott's v. *stenocarpa-coronopifolia* may, at least partly, belong to *C. trevirorum*, perhaps also *C. agrestis* Jordan—capsules 7 x 5.

Capsella B.-p. (L.) germanica E. At. (I. p. 76; II. p. 71, class VII.). (Plate 9.)

Leaves and stem as in the preceding: capsules cuneiform with almost straight lateral margins, 5 x 4, notch insignificant; wr. numerous, able to withstand frost; lobes incised, soon narrow, kyphotic to lunulate.

From Bremen and the Rhine, cultivated. C. E. Britton found similar individuals in Surrey.

The leaves have much thinner lobes than *C. bremensis*.

[Near Sonning, Berks, May 1893 (as *densifolia*); Osney, Oxford, 1885 (named *cuneata* by Mott), Druce; Cliftonville, Brighton, Sussex, 1883, E. de Crespigny (sent to the Club as *rubella*), see *Report*; Welwyn, Herts, 1820, Blake; Raynes Park [1925 A.B.C.E.F.] and Hook, Surrey, May 1918 [1932], Britton.]

Capsella B.-p. (L.) viminalis E. At. (I. p. 44; II. p. 72, class VII.). (Plate 9.)

Leaves entire, much indented, often incised; stem firm, with long branches; capsules 6-7 x 4, cuneiform, notch very shallow; wr. numerous, entire, soon incised.

Cultivated from Bremen. Similar form also cultivated from Watton, Norfolk (F. Robinson). *Cf. Rep. B.E.C.* 210, 1917: 490. 1918.

19 OCT. 1927

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THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

REPORT FOR 1920

OF THE

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(CONVENIENTLY ABBREVIATED REP. B.E.C.)

BY THE

EDITOR AND DISTRIBUTOR,

G. C. BROWN.

VOL. VI. PART II.

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September 1921.

REPORT OF THE DISTRIBUTOR FOR 1920.

The number of sheets contributed by the members for the 1920 distribution amounted to 4837, a number slightly less than the average received for the past few years. It will be noticed that the names of several well-known contributors are absent from the list of parcels received, and the loss of the excellent specimens one had grown to expect from them each year tends to reduce both the quantity and quality of the material. Several new members have contributed plants of considerable interest.

The quality of the specimens was, on the whole, high, some might well have been rejected but one hesitates to adopt drastic measures. The Club is much indebted to Rev. H. J. Riddelsdell for his excellent and extensive series of *Rubus*, *Rosa*, and *Hieracium*; to Mr C. E. Salmon for his series of the new var. *leptochila* of *Epipactis viridiflora*; to Mr W. H. Pearsall for his further contribution of *Hydrilla* and other excellent specimens. Among critical genera, which were well represented, were *Euphrasia*, *Mentha*, *Centaurea*, and *Potamogeton*. *Ranunculus* and *Erophila* received little attention.

The thanks of the Club are due to Messrs W. Barclay, W. C. Barton, A. Bennett, C. E. Britton, C. Bucknall, Drs E. Drabble and G. C. Druce, Mr J. Fraser, Mrs E. S. Gregory, Messrs J. Groves, A. Bruce Jackson, W. H. Pearsall, H. W. Pugsley, C. E. Salmon, and the Revs. H. J. Riddelsdell and T. Stephenson for their kindness in supplying comments on the plants submitted to them, and also to members whose notes appear in the *Report*.

G. C. BROWN.

16 Lion Walk,
Colchester.

LIST OF PARCELS RECEIVED.

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Total,	4837

Ranunculus Flammula L., forma. By the Dart, S. Devon, September 1920. Coll. E. S. TODD; comm. G. C. DRUCE.

R. sardous Crantz. Waste ground, Bradford, v.-c. 64, July 13, 1920. All the specimens were prepared from one plant, which bore 730 flowers and fruiting heads, besides scores of unopened buds.—J. CRYER.

R. [*Drouetii* F. Schultz]. Pond, Llandough-juxta-Cardiff, v.-c. 41, May, 1920.—A. E. WADE. "*R. trichophyllus* Chaix."—PEARSALL.

R. trichophyllus Chaix, var. *tripartitus* Koch. Pond near old lead mines on limestone ridge, South of Castleton, Derbyshire, June 13, 1920. I am afraid the material is rather scrappy.—R. S. ADAMSON. "Is f. *Godronii* (Hiern). In my judgment Koch's var. *tripartitus* is more nearly synonymous with var. *triphyllus* (Hiern)."—PEARSALL. "I do not know Koch's plant, but these specimens seem to come under aggregate *R. heterophyllus* rather than *R. trichophyllus*. I have never seen an undoubted *R. trichophyllus* with the ultimate segments of the leaf so elongate and filiform."—WHELDON.

R. heterophyllus Weber, var. *triphyllus* Hiern. Ditch, Grangetown, Cardiff, v.-c. 41, May, 1920.—A. E. WADE. "Yes, of Hiern (with very slightly hairy carpels, peduncles equalling leaves, and petals 9-veined) but not of Wallroth, which is described as having glabrous carpels, long peduncles, exceeding leaves and petals 7-veined."—WHELDON. "Is characteristic *R. Baudotii* Godr."—PEARSALL.

R. Ficaria L., var. *incumbens* F. Schultz. In a coppice, Ashton Park, N. Somerset, March 24, 1920. The variety depends on the overlapping lobes of the lowest leaves and is rather a poor thing, not often met with in an extreme state. I distributed specimens from the same locality some years ago. There is no doubt, therefore, that the variety, such as it is, is a permanent one, coming true from seeds or bulbils.—J. W. WHITE. "No doubt, but the real value of this variety is shown by the presence on the stem of one leaf, which is strongly sinuate and divergent."—RIDDELSDELL. "None of the leaf-lobes on my example overlap, so it is difficult to realise how it can come under F. Schultz's *incumbens*."—SALMON. "Yes, var. *incumbens* Schultz, but not an extreme example."—ADAMSON. "In the *Camb. Flora* it is treated as a soil condition, of which at present we lack experimental proof. The forma *luxurians* (*l.c.* iii., 126) seems to be open to a similar suggestion. It grows with its feet in the water. The form with divergent leaf-lobes is *divergens* (F. Schultz), not *decumbens* as given in the *Camb. Flora*."—DRUCE.

R. Ficaria L., forma. [1673]. Hedgebank, Stoke-by-Nayland, W. Suffolk, v.-c. 26, April 11, 1920. Leaves more deeply dentate than usual, plants forming a continuous bed though not obviously stoloniferous. Is it Horwood's var. *sinuata*?—G. C. BROWN. "A striking form which I have found but for which I do not know a name. The forms of this plant need careful culture experiments before any should be raised to varietal rank."—ADAMSON. "Under Horwood's var. *sinuata.*"—DRUCE.

Fumaria Bastardi Bor. Sandy fallows, Rush sandhills, Co. Dublin, Ireland, September 15, 1920.—C. WATERFALL. "Correct." —PUGSLEY.

F. parviflora Lam., var. *acuminata* Clav. [443]. Cultivated land, Watton, v.-c. 28, July, 1920.—F. ROBINSON. "Apparently so, but the specimen sent is weak and shade grown and shows no flowers."—PUGSLEY.

Radicula palustris Moench. [938]. Marshy loch-side, 10 feet above sea-level, Loch of Garson, North Ronaldshay, Orkney, August 21, 1920. Native, rare.—H. H. JOHNSTON. "Correct."—RIDDELSDELL. "A rare plant in the Islands, it was first recorded in *Rep. B.E.C.* 54, 1909. Strictly speaking the name should be *R. islandica* (Oeder) which preserves the earliest trivial."—DRUCE.

R. amphibia (L.) Druce. Ditch near Park Farm, Bosham, Sussex, June, 1920.—R. J. BURDON. "Is var. *indivisa* Druce, with upper leaves entire or occasionally with one or two minute teeth."—PEARSALL.

Barbarea verna Asch. Gravel pit, Nuns Close, Hitchin, Herts, v.-c. 20, June 23, 1920. Petals only twice as long as sepals.—J. E. LITTLE "Yes, upper leaves without marginal cilia below."—WHELDON.

B. vulgaris [R.Br.] Ait., var. *arcuata* Fr., subvar. *brachycarpa* A. B. Jackson. Wymondley Road, Hitchin, Herts, v.-c. 20, June 20, 1920. Same plant from which specimens were distributed in 1917, 1918, 1919. Vide *Rep. B.E.C.* 807, 1919.—J. E. LITTLE.

Arabis petræa Lam. Ben Laoigh, W. Perth, 2200 ft. alt., July 16, 1881. Coll. T. ROGERS; comm. J. COSMO MELVILL. "This is the var. *grandifolia.*"—DRUCE.

Erophila verna Meyer. Burridge Heath, N. Wilts, May, 1920. Coll. C. P. HURST; comm. G. C. DRUCE. "I should think very large *E. vulgaris* DC."—ADAMSON. "A rather long-leaved form of

Draba majuscula Rouy & Fouc."—WHELDON. "This robust plant with broad leaves, stout stems, large oblong silicles on pedicels thrice their length, large petals twice the length of sepals, with many bi- or trifid hairs would be placed under *E. majuscula* Jord. by those who separate it from *E. verna* (*E. vulgaris* DC.). Boreau and Clavaud do not admit the latter as a segregate name. The less robust forms (*Draba vulgaris* R. & F.) also come under their *E. majuscula*."—LITTLE.

E. stenocarpa Jord. ? Dry sandy bank near Mildenhall, W. Suffolk, April 20, 1920.—R. S. ADAMSON. "Seeds far too numerous, and silicles about double the width of those of *Draba lanceolata* Neilr. which = *E. stenocarpa* Jord. I think it agrees better with *D. majuscula* R. & F., and is perhaps nearest to var. *occidentalis* (Jord.) R. & F."—WHELDON. "Yes."—LITTLE.

Cochlearia anglica L. Estuary of R. Taff, Cardiff, v.-c. 41, May, 1920.—A. E. WADE.

C. danica L. Base of walls, Walton, Liverpool, v.-c. 59, March 30 and April 15, 1920.—J. A. WHELDON.

Wilckia (*Malcolmia*) *maritima* Scop. Naturalised on shingle beach, Kingsdown, Kent, April 3, 1920.—H. E. FOX. "Yes, its earliest name is *Wilckia maritima* Scop. An alien from Europe and a well-known garden plant."—DRUCE.

Sisymbrium Sophia L. Sandy fallow on roadside near Rush, Co. Dublin, Ireland, September, 15, 1920.—C. WATERFALL.

S. orientale L. Sommersdale Gravel Pit, Chichester, Sussex, June 14, 1920.—R. J. BURDON. "Yes."—DRUCE, RIDDELSDELL, and THELLUNG. Also from waste ground, Grangetown, Cardiff, v.-c. 41, June, 1920.—A. E. WADE. "This is forma *irioides* Thell."—THELLUNG.

Bursa pastoris Weber, var. *batavorum* (Almq.). [W. 20]. The Parks, Oxford, July, 1920.—G. C. DRUCE. "*C. batavorum* appears to be a common British form. I have gathered it at several Surrey localities, as well as in Kent, on the evidence of Prof. Almquist, who has identified my plants. The species exhibits a good deal of variation in the radical leaves, ranging from almost entire forms to leaves deeply pinnatifid as in the plant before me, which has leaves characteristic of *C. Bursa-pastoris*, var. *stenocarpa-coronopifolia* Mott. This type of leaf is the distinguishing feature of Schull's elementary species *Bursa bursa-pastoris heteris*. Apart from the variable forms of radical leaves, a common feature of the plants that Almquist places to his *batavorum* is the equilateral triangular form of the capsule."—C. E. BRITTON.

B. pastoris Weber. Shingle by the sea. Walmer, E. Kent, April 5, 1920.—H. E. FOX.

B. pastoris Weber, var. *densifolia* (Mott). Waste ground, Grangetown, Cardiff, v.-c. 41, May 1920.—A. E. WADE.

Brassica alba Boiss. Potato patch, Glentana, Foxrock, Co. Dublin, Ireland, August 1, 1920.—C. WATERFALL. Also garden weed at Clifton, Bristol, July and August, 1920.—J. W. WHITE. "Yes, admirably displayed."—PEARSALL.

B. incana Doell. Waste ground, Bradford, v.-c. 64, alt. 300 ft., July 30, 1920.—J. CRYER. "Correct, as far as can be seen without fruit."—RIDDELSDELL. "Young, but characteristic."—PEARSALL. "Yes."—THELLUNG.

Diplotaxis [*tenuifolia* DC.]. Sandy fallow, Rush sandhills, Co. Dublin, Ireland, September 15, 1920.—C. WATERFALL. "No, this is *D. muralis*, var. *Babingtonii*. *D. tenuifolia* has narrower leaf segments, larger flowers on longer pedicels, etc."—SALMON, RIDDELSDELL, & DRUCE.

Lepidium latifolium L. Banks of River Taff, Grangetown, Cardiff, v.-c. 41, August 1920. Coll. A. E. WADE; comm. Nat. Mus. of Wales. "Long known as a Glamorgan plant. There is a Neath specimen (no doubt native) dating from 1840-50 in Motley's herbarium."—RIDDELSDELL.

L. ruderale L. Garden weed at Failand House, N. Somerset, July 1920. Collected with Miss Agnes Fry.—J. W. WHITE. "*L. neglectum* Thell."—LITTLE, PEARSALL, DRUCE, SALMON, THELLUNG, and WHELDON.

L. virginicum L. Taplow Gravel Pits, Bucks, June 18, 1920.—A. WEBSTER. "Is not this *L. ruderale*?"—SALMON. "This is *L. densiflorum* Schrad."—THELLUNG.

Viola Riviniana × *canina*. [953]. Hedgebank, Earls Colne, N. Essex, v.-c. 19, May 12, 1920. "There is evidently some admixture of *canina* here. Mark the broader stipules with processes rather than teeth and the rounded capsule." Mrs GREGORY *in litt.*, January, 1920.—G. C. BROWN. "The Vienna rules exact that the names of hybrids should follow alphabetical order; therefore *canina* precedes *Riviniana*. The sessile upper leaves of these plants suggest the form (not var.) *pseudo-mirabilis*."—GREGORY.

V. hirta L. [1672]. Chalk pit, Somersham, E. Suffolk, v.-c. 25, April 2 and June 17, 1920. Flowers purplish-blue, spur lighter. strongly hooked, stipules green, strongly fringed, young leaves dull green, rootstock greenish-white.—G. C. BROWN. "*V. hirta* L., var. *hirsuta*, approaching f. *nudiflora* (hairs on lateral petals almost absent)."—GREGORY.

V. hirta L., var. *hirsuta* (Schultes) Lange. [1688]. Bank, Edwardstone, W. Suffolk, v.-c. 26, May 13, 1920. Cleistogamous stage. Flowers bluish-violet, imperfect.—G. C. BROWN. "*V. hirta* L., var. *hirsuta*, f. *nudicaulis*. The imperfect flowers are semi-cleistogamous. With reference to the name of Schultes see note on p. 24 of *British Violets*; wherefore our *hirsuta* (which otherwise fully deserves its name) is clearly not the var. *hirsuta* of Schultes."—GREGORY.

V. arvensis Murr., var. Waste ground near Penarth Ferry, Glamorgan, July 1920.—A. E. WADE. "Is *V. subtilis* Jord."—PEARSALL.

V. segetalis Jord. Among oats on reclaimed peat moor near Foxfield "Mosses" at Wreak's Bridge, Causeway End, N. Lancs, v.-c. 69b, September 28, 1920.—W. H. PEARSALL. "Yes, *segetalis*."—DRABBLE.

V. arvatica Jord. Among oats, Sawrey, N. Lancs, v.-c. 69b, August 5, 1920.—W. H. PEARSALL. "Yes, very good *arvatica* as it usually grows in this country."—DRABBLE.

V. Curtisii Forster. [1753]. Sutton Common, E. Suffolk, v.-c. 25, June 13, 1920. My Ref. No. 100 sent to the Club in 1913, vide *Rep. B.E.C.* 457, and passed as above by Dr Drabble, was from the same station, but wrongly labelled "Bromeswell Walks."—G. C. BROWN.

Dianthus prolifer L. Pagham, Sussex, July 12, 1920.—A. WEBSTER.

Silene maritima With., inland form. Amongst shale on bank, Grange-in-Borrowdale, Cumberland, v.-c. 70, June 21, 1920.—C. WATERFALL.

S. latifolia Rendle & Britton, var. *puberula* (Jord.). Waste ground near Penarth Ferry, Glamorgan, July 1920.—A. E. WADE.

" Rightly named as per the *London Catalogue*, but more usually cited as *S. inflata* Sm. or *S. Cucubalus* Wibel."—PEARSALL.

Cerastium nigrescens Edm. (the oldest name). Balta Sound, Unst (locus classicus), July 1920.—G. C. DRUCE. " Yes, *C. arcticum* Lange, forma *nigrescens* Druce."—ADAMSON. Also as *arcticum*, var. *Edmondstonii* Beeby from the same place.—R. J. BURDON.

C. nigrescens Edm., var. *compactum* (Syme). Ben Nevis, Inverness, July 1918.—G. C. DRUCE.

C. subtetrandrum Murb.? Burrafirth, Unst, July 1920.—G. C. DRUCE. " I gathered a plant very similar to this on Yarmouth Denes in 1914 which Mr A. Bennett named for me *C. tetrandrum* × *semidecandrum*."—F. ROBINSON. " I do not pretend to know Murbeck's plant, but this certainly differs from his description of it in having long floriferous branches from below the middle, and even to base of stem; and the seeds are as in the ordinary *C. tetrandrum* Curt. 6 mm. in diameter."—WHELDON. " Prof. Lindman refers this to *tetrandrum*. It differs much from the usual Shetland form, where *semidecandrum* is not recorded."—DRUCE.

Stellaria neglecta Weihe. Damp hedgebank, valley of River Bollin, Cheshire, April 24, 1920. Very common in moist situations in N. Cheshire.—R. S. ADAMSON. " My example has no fruit but the other characters point to the correctness of the name."—SALMON.

S. Holostea L., forma. Birdlip Hill, v.-c. 33, April 18, 1920. Coll. J. W. HAINES. One homogeneous patch, about 5 yards long, by the roadside, ordinary *Holostea* surrounding it. The petals are reduced and the sepals apparently have a rather stronger tendency to ciliation than in type, but the latter difference is slight.—H. J. RIDDELSDELL. " This approaches the var. *angustifolia* R. & F. Fl. Fr. iii., 232, which has smaller flowers than the type and leaves 2-3 mm. broad. These are 3-4 mm. In the type they are 5-10 mm. broad."—DRUCE. [Mr Haines reports that the same form persisted in 1921.]

Arenaria norvegica Gunn. On serpentine, Balta Sound, Unst, Shetland, July 24, 1920.—R. J. BURDON.

A. serpyllifolia L., var. *macrocarpa* Lloyd. Par Sands, v.-c. 2, May 28, 1920. This agrees with the descriptive note in Bab. *Man.*, ed. viii., p. 61. The sepals are hairy but I can see no glandular hairs.—F. RILSTONE. "This appears to be *A. Lloydii* Jord. (=var. *macrocarpa* Lloyd), rather than var. *sphaerocarpa* Tenore. The

Camb. Brit. Flora gives a singularly meagre contrasting account of these two closely allied plants."—SALMON.

A. tenuifolia L. In great quantity on railway ballast, Rodmarton, v.-c. 34, July 15, 1920. Also seen by roadside near Cherrington, and on railway at Bourton-on-the-Water, v.-c. 33. It is certainly native in some of its Gloucestershire localities, especially on the Cotteswolds.—H. J. RIDDELSDELL. "Yes, *Alsine tenuifolia* Crantz, var. *Vaillantiana* DC."—ADAMSON.

Sagina apetala Ard. Dry rock face, Polperro, v.-c. 2, June 7, 1920.—F. RILSTONE. "Yes, the more frequent form, var. *barbata* Fenzl."—SALMON & PEARSALL.

S. maritima Don. Par Sands, v.-c. 2, May 28, 1920.—F. RILSTONE. "Yes, leaves eglandular, glabrous, muticulous, but capsules smaller than usual."—PEARSALL. "Yes, many of the examples exactly match *E.B.*, t. 2195."—SALMON. "A weak and small state of var. *debilis* Jord., having decumbent stems, flexuous peduncles, and no central rosette."—WHELDON.

S. maritima Don, var. *prostrata* Townsend, in *Rep. B.E.C.* 438, 1894. Cliffs north of Peel, Isle of Man, July 6, 1920. Quite prostrate, leaves of central rosette blunt, calyx usually closed in fruit, capsule larger than in the type. This seems to be a good and striking variety. It is very unusual to see the basal rosette persisting in *S. maritima* without the central axis elongating and flowering.—J. A. WHELDON. "Agreed."—PEARSALL. "This interesting plant is perhaps best left as labelled, but Townsend, *Rep. B.E.C.* 438, 1894, distinctly states his plant is glabrous. In the two examples before me fine cilia may be detected upon *some* of the pedicels, stems, and leaves, but the *majority* are entirely glabrous. Thus Mr Wheldon's plant makes some approach to var. *ciliata* Nordst., *Report* 131, 1914, and it may prove that this variety and Townsend's *prostrata* are too closely allied to be kept apart."—SALMON. "Is this more than a forma? A. & G. *Syn.*, v. 805, place var. *prostrata* Towns. under var. *debilis* (Jord.) Bab., which has elongated stems and internodes."—ADAMSON.

Spergularia salina Presl. Among shingle, Penarth Ferry, v.-c. 41, July 1920.—A. E. WADE. "No, it is *S. marginata* Kit."—RIDDELSDELL. "Is not this *S. media* Presl = *S. marginata* Kit.? In the *Cambridge Flora* Presl's name *S. media* (established for this species in *Flora Sic.* i., 161, 1826) is rejected for the much later one of *S. marginata* Kit. on the ground of its being a *nomen confusum*, but evidence as to this is not conclusive."—DRUCE. "All *S. media* Presl."—ED.

Montia fontana L., var. *intermedia* Druce in *Camb. Brit. Flora.* [466]. Stream head at 2000 ft., Brecon Beacons, v.-c. 42, September 4, 1920. N.C.R. for v.-c. 42, I believe.—W. C. Barton. "*M. chondrosperma* Fenzl, var. *intermedia* Beeby. Marginal tubercles more pronounced."—Salmon. "Yes."—Adamson. "If the two Montias are kept as distinct species it should be *M. verna*, var. *intermedia* Druce in *Rep. B.E.C.* 332, 1908. Beeby named it a var. of the sub-species *minor.*"—Druce.

Althaea hirsuta L. St Ouen's, Jersey, July 1902. An adventive species here. Coll. F. Piquet; comm. G. C. Druce.

Linum angustifolium Huds. Roadside, Barry, Glamorgan, May 1920. Coll. A. E. Wade; comm. Nat. Mus. of Wales. "Yes, not uncommon in v.-c. 41."—Riddelsdell.

Geranium phaeum L. Origin, near Alderley, W. Gloster, cult. Clifton, Bristol, May 15, 1920. Believed to be of garden origin wherever found in Britain, but there is no geographical reason why it should not occur as an indigenous native.—J. W. White. See *Flora of Bristol.* Also from H. E. Fox, origin, woods near Durham, cult. Putney, May 20, 1920.

G. rotundifolium L. Banks near Penarth Ferry, v.-c. 41. July, 1920.—A. E. Wade. "Correct."—Riddelsdell. Also from gravel pit, Whyke, Chichester, May 28, 1920.—R. J. Burdon. "Yes, a N.C.R."—Druce.

G. Robertianum L., var. *rubricaule* Hornem. Shingle beach, Barry, v.-c. 41, July, 1920.—A. E. Wade. "I know the plant well in the locality named, and hope that it is correctly placed under this variety."—Riddelsdell.

Oxalis Acetosella L., var. *subpurpurascens* DC. Hedgebank, Tongwynlais, Glamorgan, May, 1920. Coll. A. E. Wade; comm. Nat. Mus. of Wales. "De Candolle (*Prod.* 1700) describes a var. *caerulea* and a var. *subpurpurascens*. These belong to the latter. Reichenbach (*Ic. Fl.* 4898b) also has a var. *lilacina*. Rouy & Foucaud reduce them all to subvarieties. Culture experiments are needed to test their permanence."—Druce.

Impatiens parviflora DC. Weed in waste ground and gardens, Putney, Surrey, August, 1920.—H. E. Fox.

Genista anglica L. Lizard Downs, W. Cornwall, May 4, 1920.—C. V. B. Marquand.

Medicago arabica Huds. Cliffs west of the Lizard, W. Cornwall, May 6, 1920.—C. V. B. MARQUAND.

M. lupulina L., var. *scabra* Gray, also var. *Wildenowii* (Mérat). Side by side in a piece of fallow land between Wotton-under-Edge and Nailsworth, v.-c. 34, July 16, 1920. Whether a distinction in name is worth making between eglandular and glandular hairs—which is a distinction in fact—is a disputable point.—H. J. RIDDELSDELL. "I fail to see that the legumes are 'rough with many tubercles' which characterise Gray's var."—DRUCE. Var. *Willdenowii* Mérat. I think this is var. *Willdenowii* Boenn. (non Mérat), *i.e.* the plant Rouy calls sub-var. *glandulosa* Neilr."—SALMON. "Yes, var. *Willdenowiana* Koch = var. *Willdenowii* Asch. This is better treated as a sub-var. as is done by Rouy."—ADAMSON.

Trifolium suffocatum L. Newton Abbot, S. Devon, v.-c. 3, June 28, 1920. Coll. Miss E. PARKINSON; comm. W. H. PEARSALL. "Unmistakable *T. subterraneum* L."—BRITTON, DRUCE, RIDDELSDELL, WHITE, &c.

T. repens L., forma. Witley Common, Surrey, July 15, 1920.—A. WEBSTER. "A monstrosity, frequent in this species, and in *T. hybridum*, especially on waste ground."—RIDDELSDELL. "Proliferous state."—CRYER. "This is the so-called var. *phyllanthum* Seringe, a monstrosity in which the calyces become foliaceous: first recorded by Merrett in the *Pinax* of 1666."—DRUCE.

Coronilla varia L. [1203]. Adventitious with other aliens in garden, Countess Wear, S. Devon, v.-c. 3, September, 1920. Introduced with manure from a cowyard in 1910, completely naturalised. The only previous record for Devon is in Ravenshaw's *List of Flowering Plants and Ferns of Devon*. "Lynton; rocks at Berry Head, Dr Blomfield."—W. S. M. D'URBAN. "Yes."—DRUCE. "Beautifully prepared specimens."—ED.

Ornithopus perpusillus L. Small grassy common, Braithwaite, near Keswick, Cumberland, v.-c. 70, June 15, 1920.—C. WATERFALL.

Hippocrepis comosa L. Gog-Magog Hills, Cambridgeshire, June 7, 1919.—C. V. B. MARQUAND.

Vicia Cracca L., f. Barry, Glamorgan, September, 1920. Coll. P. H. HOLLAND; comm. Nat. Mus. of Wales. "A form of *V. villosa* Roth, with smaller leaflets than usual. The calyx is too asymmetrical at the base, the teeth more elongated and more filiform, and the corolla much too long for this to be any form of *V. Cracca*."—BRITTON. "Not a *Cracca* form surely; I believe it is *V. villosa*

Roth."—SALMON. "Belongs to the aggregate *V. villosa* Roth. Although the cilia of calyx teeth are fairly long and spreading and the peduncles short, I should refer it to *V. dasycarpa* Ten., of which it might be var. *angustifolia* Rouy (*V. pseudocracca* Mérat) on account of its fewer and smaller leaflets and flowers and its slender habit."—WHELDON. "I should not refer this to *villosa*."—DRUCE.

Lathyrus tuberosus L. Barry, Glamorgan, September, 1920. Coll. P. H. HOLLAND; comm. Nat. Mus. of Wales. "A frequent ballast plant, *e.g.* at Lydney, v.-c. 34. Several strong patches maintained themselves at Cardiff Docks for some years."—RIDDELSDELL.

L. palustris L. Wicken Fen, Cambridge, July, 1920.—T. STEPHENSON.

L. pratensis L., luxuriant form. Near Wroxton, v.-c. 23, June 23, 1920. This luxuriance was frequent, especially among the Leguminosae, at the period when this gathering was made. It was not due to a wet season, for it was noticeable before the wet period of 1920. Was it due to the mild winter? H. J. RIDDELSDELL. "A luxuriant form but with flowers much smaller than those of the Shetland plant, which I call var. or sub-var. *speciosus*."—DRUCE.

L. montanus Bernh. Wood near Southam, Warwick, July, 1920. A stout erect form.—G. C. DRUCE.

L. montanus Bernh., var. *tenuifolius* Roth. On bank of colliery tramway, Coalpit Heath, W. Gloster, v.-c. 34, April 19, 1920.—I. M. Roper. "Neither of these is an extreme form of the narrow-leaved plant which Roth named *Orobus tenuifolius* and Rouy and Foucaud *Fl. Fr.* v., 271, name a 'forme' = *L. Rothii*, under which the very narrow-leaved plant is put as *β angustissimus*. Here again the width of the leaves seem independent of soil or situation and the matter calls for culture experiments; the name should be *L. montanus* Bernh., var. *tenuifolius* (Roth) Garcke."—DRUCE. "I think Miss Roper's plant is best left under type."—SALMON. Also from near Jedburgh, July 1, 1920.—R. J. BURDON. "Yes, good though not extreme examples of the variety. Miss Roper's are not so good."—RIDDELSDELL.

Spiraea Ulmaria L., var. *denudata* Boenn. Old Park, Chichester, June 24, 1920.—R. J. BURDON.

Rubus incurvatus Bab. Four Shire Stone, v.-c. 33, August 14. 1920. Quite the type.—H. J. RIDDELSDELL.

R. incurvatus Bab., between type and var. *subcarpinifolius*

Rogers MS. Four Shire Stone, v.-c. 33, August 14, 1920. I have also found the variety at this spot which thus exhibits a satisfactory series of *R. incurvatus*.—H. J. RIDDELSDELL. "Sudre (*Rubi Eur.* 24) makes it a subordinate species of *R. vulgaris* W. & N."—DRUCE.

R. Lindleianus Lees. Four Shire Stone, v.-c. 33, August 14, 1920.—H. J. RIDDELSDELL.

R. argenteus Wh. & N. [1207]. Climbing over a large Rhododendron bush, Countess Wear, S. Devon, v.-c. 3, June, 1920. The most abundant bramble about this place, climbing to a height of 12 to 15 feet. Fruit of good size and juicy.—W. S. M. D'URBAN. "May be, but if so, very untypical. The stem looks Silvatican in character, but the material sent me is too scanty for even a decent guess, especially in the absence of collector's notes."—RIDDELSDELL.

R. nemoralis P. J. Muell. In great beauty and luxuriance at Four Shire Stone, v.-c. 33, August 14, 1920. The bit of heathy ground where these brambles grow extends into Warwickshire and perhaps slightly into Worcestershire; not into Oxfordshire, I believe. —H. J. RIDDELSDELL. "Sudre (*l.c.* 68) places it subordinate to *rhamnifolius*."—DRUCE.

R. ———? [27]. Field border, Polperro, v.-c. 2, July 29, 1920.—F. RILSTONE. "The union of a very strong, furrowed, hairy stem with a highly glandular panicle is puzzling. But for the glands on the panicle, and the green underleaf, it might well go to *Godroni* Lec. & Lam. It cannot, I think, belong to the Egegrii, nor do I suspect admixture. The least unsatisfactory procedure will perhaps be to put it to *macrophylloides* Genev."—RIDDELSDELL.

R. ———? [26]. A very tall, handsome plant growing in alluvium by stream, Longcoombe Valley, Polperro, v.-c. 2, September 16, 1920.—F. RILSTONE. "*R. Questierii* Lefv. & Muell. I feel sure; very typical and N.C.R. for v.-c. 2."—RIDDELSDELL.

R. hirtifolius Muell. & Wirtg., var. *mollissimus* Rogers. Coopers Hill, v.-c. 33, July 10, 1920. The large plateau at the top of Coopers Hill (between Cheltenham and Stroud), produces a number of good brambles, as does the similar but much larger top of Haresfield Hill. This small form of *mollissimus* is in some quantity, and accompanies *R. Marshalli*, *dasyphyllus*, *botryeros*, etc.—H. J. RIDDELSDELL. "Sudre put it as a var. of *R. danicus* and cites *Brit. Rubi* No. 85."—DRUCE.

R. leucostachys Schleich., forma *umbrosa*. Princethorpe Wood, Warwick, v.-c. 38, July 20, 1920. A form in which the metallic felt on the under side of the leaves has wholly disappeared.—L. CUMMING.

R. cinerosus Rogers. Park Corner, v.-c. 23, July 28, 1920. In some quantity at this spot, but not in very good condition.—H. J. RIDDELSDELL. " This, Sudre (*l.c.* 133) puts as a var. of *R. apiculatus* Weihe, and he cites *Brit. Rubi* No. 19."—DRUCE.

R. mucronatus Blox., var. *nudicaulis* Rogers. Bournemouth, S. Hants, June 18, 1920.—H. J. RIDDELSDELL. " Sudre (*l.c.* 113) considers *nudicaulis* belongs to the Sylvatical, not to Mucronifer, which name he adopts for Bloxam's plant. The name is invalid as there is already a *mucronatus* Seringe of 1825."—DRUCE.

R. Borreri Bell-Salt. Four Shire Stone, v.-c. 33, August 14, 1920. The only record for E. Gloster, I believe, though the species grows in quantity in W. Gloster. Here it will likely be found to extend into Warwick, but I only saw one plant in v.-c. 33, and that was a form with rather small panicles, very different-looking from the luxuriant bushes found in Dorset and S. Devon.—H. J. RIDDELSDELL.

R. Radula Weihe. [22]. Field border by stream, Polperro, v.-c. 2, July 15, 1920. Plant very low growing. The October leaves were very convex.—F. RILSTONE. " Apparently Radulan, and in that case going best to *R. podophyllus* P. J. Muell. Leaflets with longer points than usual in that species. Notes, however, are lacking, and I do not feel confident enough to make it a N.C.R. for v.-c. 2."—RIDDELSDELL.

R. echinatoides Rogers. Hook Norton, v.-c. 23, August 16, 1920. Specimens in Herb. Rogers justify this being placed under *echinatoides*.—H. J. RIDDELSDELL. " Sudre (*l.c.* 129) places it subordinate to *R. aspericaulis* L. & M."—DRUCE.

R. oigoclados M. & L. [25]. A strong, low-growing plant with pale pink petals, abundant in many parts of the Polperro valley, v.-c. 2, July 23, 1920.—F. RILSTONE. " Yes, apparently, though sepals show considerable tendency to rise."—RIDDELSDELL. " Sudre places *oigoclados* M. & L. subordinate to *R. fusco-ater* Weihe, but says Rogers' *oigoclados* is a different species belonging to the Virescentes and he gives it the name *R. cenomanensis* Sudre, based on Rogers' plant in the *Handbook*, p. 27, and his No. 65 of the *Brit. Rubi.*"—DRUCE.

R. scaber Wh. & N. Park Corner, v.-c. 23, July 28, 1920. Already known from the escarpment of the Chilterns elsewhere.—H.

J. RIDDELSDELL. "Sudre (*l.c.* 193) says *scaber* W. & N. is not British at present. Rogers' *scaber* is a different species, the *R. conspectus* Genev."—DRUCE.

R. hostilis Muell. & Wirtg. In quantity in a wood, Wolford Heath, Warwickshire. This locality adjoins the Gloucestershire, Four Shire Stone, and Lower Lennington area, and like that produces *R. nemoralis*, etc. I found *R. hostilis* here some years ago.—H. J. RIDDELSDELL.

R. Koehleri Wh. & N. Field border, Polperro. v.-c. 2. July 30, 1920. Plentiful in the Polperro valley. A low-growing plant but of striking appearance on account of the bright red acicular and glandular clothing of the panicle. A proportion of the new growth is fertile, producing very robust panicles.—F. RILSTONE. "*R. hystrix* Wh. & N."—RIDDELSDELL.

R. Koehleri Wh. & N., var. *cognatus* N. E. Brown. Twelve O'clock Drive, Brandon, Warwick, v.-c. 38, September 1. 1920. As far as I know a record for v.-c. 38.—L. CUMMING. "I hesitate a little between this and *R. hystrix* and should call it *R. cognatus* N. E. Br., going off towards *R. hystrix*. Pink petals and shape of leaflet make for the latter, but the thick, soft foliage, broad panicle, fruit sepals not clasping, and on the whole the stem armature make for *cognatus*. Stem pieces, which I retained earlier when going through Mr Cumming's gatherings, are more convincing than those received through the Club, but I am not sure that some *hystrix* was not among them. But Rogers' *Handbook* points out the great variability of the *cognatus* armature, and the difficulty of distinguishing between herbarium specimens of *hystrix* and *Koehleri*. N.C.R. for v.-c. 38."—RIDDELSDELL.

R. Kaltenbachii Metsch. Open woodland, Leigh Woods, N. Somerset, July and August, 1920.—J. W. WHITE. "Beautiful specimens, correctly named."—RIDDELSDELL. "A beautifully prepared and quite homogeneous gathering."—ED. "This again Sudre (*l.c.* 228) says is not British, Rogers' plant being in part *R. Menkei* Weihe. He cites *Brit. Rubi* 48 and 163 for it. *R. tereticaulis* Rogers' *Handb.* p. 91 (not of P. J. Muell.) also belongs to *Menkei*."—DRUCE.

R. hirtus Waldst. & Kit., var. *flaccidifolius* (P. J. Muell.). Haresfield Hill, v.-c. 33, July 13, 1920. In great variety over a arge area, extending to Pitchcombe Wood, etc. Seen by Mr Rogers n 1912 (coll. E. M. Day) and named by him. "*Flaccidifolius* I hink, and if so new for Gloster."—RIDDELSDELL. "This, Sudre (*l.c.* 215) places as synonymous with *R. napophiloides* Sudre. He says it is not Mueller's plant."—DRUCE.

R. dumetorum Wh. & N. By garden wall, Polperro, v.-c. 2, July 12, 1920.—F. RILSTONE. "Yes, var. *raduliformis* Ley. N.C.R. for v.-c. 2."—RIDDELSDELL.

R. Bucknalli J. W. White. Westridge Wood, Wotton-under-Edge, v.-c. 34, July 16, 1920. The original locality.—H. J. RIDDELSDELL.

R. caesius L. Four Shire Stone, v.-c. 33, October 14, 1920. I suppose this is, judging by the sepals, etc., but it is unusually fine, and very late flowering for the species. The flowers were large enough for *R. Balfourianus*.—H. J. RIDDELSDELL.

R. caesius L., var. *mollifolius* Sudre. By pond, Nailsea, N. Somerset, v.-c. 6, August 14, 1920. This name was kindly given to me by Mr R. A. Rolfe, A.L.S., but I cannot trace it. The plant is being cultivated at Kew.—I. M. ROPER. "*R. caesius* L., certainly. Focke *Species Ruborum* 1914, does not index *mollifolius.*'—RIDDELSDELL. "Sudre describes it in his *Rubi Eur.* p. 234. He says it is the var. *agrestis* of Authors and perhaps of W. & N."—DRUCE.

Alchemilla alpestris Schmidt. Grassington, v.-c. 64, alt. 850 ft., June 11, 1920.—J. CRYER. "This is the plant common in the hilly parts of Glamorgan, which I have been used to refer to *A. alpestris.*"—RIDDELSDELL. "Yes."—SALMON and ADAMSON.

A. alpina L. Abundant on the shores of Wastwater, Cumberland, v.-c. 70, at the foot of the "screes," October 2, 1920.—W. H. PEARSALL. Also from rocky edge of footpath behind Castle Crag, near Grange-in-Borrowdale, Cumberland, v.-c. 70, June 21, 1920.—C. WATERFALL.

Poterium Sanguisorba L., forma. [2193]. Lane by Epsom Downs, Surrey, June 2, 1920. A curious form in which the principal stems develop from the head of flowers a number of smaller secondary heads borne on slender pedicels.—C. E. BRITTON. "I should like to see this in fruit. There is none, unfortunately, on my example. The habit reminds me of *P. muricatum.*"—SALMON. "A curious monstrosity in which the central stem has developed into a paniculate inflorescence."—DRUCE.

Rosa arvensis Huds., var. *biserrata* Crép. [2041]. Near Upper Gatton, Surrey, v.-c. 17, August 20, 1920. This is not so good a form as the one from Hollington, Derbyshire, coll. W. R. Linton, but may pass for the var., which is a very rare one. Some degree of irregular serration is, however, not infrequent. The fruit, which is absent from some specimens, is subglobose or broadly ovoid. The labels are dated August 28 in error.—A. H. Wolley-Dod. "A very interesting plant, with prickles unlike typical *arvensis*."—Barclay.

The following Roses have all been examined and named by Col. A. H. Wolley-Dod. Wherever his naming is qualified the label reproduces the fact.—H. J. Riddelsdell.

R. sphaerica Gren. Near Wigginton, v.-c. 23, September 14, 1920.—H. J. Riddelsdell. "Yes, a round-fruited *Lutetiana*."—Barclay.

R. dumalis Bechst. Hook Norton, v.-c. 23, August 28, 1920.—H. J. Riddelsdell. "I think *R. dumalis* Bechst., but hardly more biserrate than is often found in the Transitoriae."—A. H. W.-D. "Yes."—Barclay.

R. canina L., var. *transitoria* R. Kell. Wigginton Heath, v.-c. 23, September 11, 1920. Irregularity of serration slight.—H. J. Riddelsdell. "Yes."—Barclay.

R. canina L., var. *transitoria* R. Kell. South Newington Hill, v.-c. 23, August 24, 1920.—H. J. Riddelsdell. "I should call this *R. canina* L., var. *transitoria* R. Kell., but I think Dingler would consider it biserrate enough for *R. dumalis* Bechst."—A. H. W.-D. "Yes."—Barclay.

R. leiostyla Rip. Near Bourton-on-the-Water, v.-c. 33, September 4, 1920. "Yes, I agree."—Barclay. Also from Wigginton, v.-c. 23, September 11, 1920.—H. J. Riddelsdell. "Yes, a form of *dumalis* with glabrous styles."—Barclay.

R. sphaeroidea Rip. Near Bourton-on-the-Water, v.-c. 33, September 4, 1920.—H. J. Riddelsdell. "Towards *R. biserrata* Mér., but certainly not that."—A. H. W.-D. "Yes, a *dumalis* form with subglobose fruit which may be called *R. sphaeroidea* Rip.—Barclay.

R. verticillacantha Mérat. Wigginton, v.-c. 23, August 19, 1920.—H. J. Riddelsdell. "I agree."—Barclay.

R. verticillacantha Mérat. Hook Norton, v.-c. 23, August 28, 1920.—H. J. Riddelsdell. "Under *R. verticillacantha* Mérat, but the small leaflets and globose fruit are abnormal."—A. H. W.-D. "The presence of sub-foliar glands on secondary nerves, few on some leaflets, more numerous on others, as well as its glandular peduncles, shows that this specimen belongs to the group of *R. Blondaeana* Rip."—Barclay.

R. Blondaeana Rip. Road from Stow-on-the-Wold to Bourton-on-the-Water, v.-c. 33, September 4, 1920. Colonel Wolley-Dod says:—"One of the *Blondaeana* group, but it takes some searching to find sub-foliar glands, and the peduncles are very little hispid. It is best under *R. Blondaeana* Rip. for want of a closer varietal name." All from one bush by the roadside.—H. J. Riddelsdell. "In examining with the microscope, I could only find on seven or eight leaflets one gland on a secondary nerve of one leaflet. This, therefore, cannot belong to *R. Blondaeana* Rip., but is a somewhat weak form of *R. verticillacantha* Mérat."—Barclay.

R. dumetorum Thuill., f. *semiglabra* (Rip.). Hook Norton, v.-c. 23, August 28, 1920.—H. J. Riddelsdell. "Yes, hardly differs from *R. urbica* Lém."—Barclay. Also from Swerford Heath, v.-c. 23, August 24, 1920.—H J. Riddelsdell. "Would fit *R. sphaerocarpa* Rip. quite as well as *semiglabra* Rip."—Barclay.

R. sphaerocarpa Pug. Wigginton, v.-c. 23, August 19, 1920. —H. J. Riddelsdell. "Yes."—Barclay.

R. tomentella Lem. Wigginton, v.-c. 23, September 12, 1920. Towards *R. sclerophylla*.—H. J. Riddelsdell. "Yes, but I don't see any tendency towards *R. sclerophylla*."—Barclay.

R. Carionii Chab. Wigginton Heath [650], v.-c. 23. October 5, 1920. "I put all plants with very biserrate, hairy leaflets in the Tomentellae, as I have no name for them in the Dumetorum group, but I am not sure that it is sound. This specimen has, however, a decided Tomentella look."—A. H. W.-D.—H. J. Riddelsdell. "If the name refers to a form of *R. tomentella* without or with only a trace of sub-foliar glands, I agree it is *R. Carionii* Déségl. and Gillot."—Barclay.

R. scabriuscula Sm. South Newington Hill, v.-c. 23, August 1920.. "A most peculiar plant, certainly one of the Scabriusculae with leaflets like those of *R. sylvestris*, but eglandular and prickles untypical. It must go under that aggregate."—A. H. W.-D.—H. J. Riddelsdell. "Yes."—Barclay.

R. omissa Déségl, teste A. H. W.-D. By the Windrush above

Bourton-on-the Water, v.-c. 33, September 4, 1920. With unusually smooth peduncles. On record already for v.-c. 33.—H. J. Riddelsdell. "Yes."—Barclay.

R. spinosissima L., with yellow petals. [V. 72]. Fairnilie, Selkirk, August 1919. "This large growing yellow-flowered rose is often to be seen in cottage gardens in the Lowlands, but I do not know its correct name, nor was Miss Willmott able to fix it. The flowers are a dull orange yellow."—G. C. Druce.

Crataegus monogyna Jacq. (*Oxyacantha* L.). Seedlings, under hedge in field, Alphamstone, N. Essex, v.-c. 19, May 9, 1920.—G. C. Brown.

C. Oxyacantha × *oxyacanthoides*. South Newington, v.-c. 23, styles 1-2. Also Wigginton, v.-c. 23, May 21, 1920.—H. J. Riddelsdell. "It seems that both gatherings have the suggested parentages."—Druce.

C. oxyacanthoides Thuill. [Q. 64]. Cuckoo Lane, Freeland, Oxon, September, 1918.—G. C. Druce. Also from South Newington, where it is frequent, v.-c. 23, May 21, 1920.—H. J. Riddelsdell.

Saxifraga stellaris L. Swamps on side of Eel Crags Pass, above Grange-in-Borrowdale, Cumberland, v.-c. 70, June 21, 1920.—C. Waterfall. Also from Nant Francon, v.-c. 49, May 24, 1920. In great abundance.—J. Cryer.

Callitriche ———. [442]. Ditch, Rocklands, v.-c. 28, May 31, 1920. From the same locality as my [387] sent in 1918.—F. Robinson. "There are evidently two species growing in this water. In 1918 Mr A. Bennett's specimen was *C. verna* L. and mine was *C. stagnalis* Scop. This year my sheet shows one species (fruiting) which is undoubtedly *C. stagnalis*, and another (without fruit) having longer internodes and narrower leaves with the laminae tapering at both ends. In the absence of fruit it is impossible to name it with certainty."—Pearsall.

C. ———. [441]. Ditch, Great Hockham, v.-c. 28, May 28, 1920.—F. Robinson. "With small keeled fruit and very long persistent reflexed style it suggests *C. polymorpha* Lönnr. [442] does not contain mature fruit and is rather different."—Riddelsdell. "[441] is *C. stagnalis*."—Pearsall. "I see no suggestion of *polymorpha*."—Druce.

Lythrum Hyssopifolia L. Waste ground, Bradford, v.-c. 64.

September 11, 1920. In great abundance.—J. Cryer. Also from Marais, Jersey, July, 1870. Coll. J. Piquet; comm. G. C. Druce.

Epilobium hirsutum L., var. *villosissimum* Koch. Hedge, Crox Bottom, Bishopsworth, N. Somerset, v.-c. 6, September 4, 1920.—I. M. Roper. "Yes, very good examples of the variety."—Adamson & Druce.

E. obscurum Schreb. Woodchester, v.-c. 34, July 14, 1920. I do not find that the book description of the leaves of *E. obscurum* as sessile (see Bab. *Man.* ed. ix.) always holds good; they are often distinctly though shortly stalked.—H. J. Riddelsdell. "Yes."—Adamson.

E. obscurum Schreb. [464 A & B]. Allotment, Manor Road, Richmond, Surrey, v.-c. 17, July 16, 1920. Coll. J. Fraser; comm. W. C. Barton. This gathering was sent to me under another specific name, but I cannot separate any specimens from *E. obscurum.* I send it to the Club as illustrating variation in a common plant all grown apparently under the same conditions. The plants labelled [464 A] seem to show more or less the characters of var. *lucidum* Rouy & Camus Fl. Fr. vii., 182—"Tiges à lignes peu visibles; feuilles molles, translucides, moins nettement dentées; fleurs souvent d'un blanc rosé." In *Journ. Bot.* 144, 1889, and 5, 1890, the Rev. E. S. Marshall quotes Haussknecht (*Monographie der Gattung Epilobium*): "Of constant varieties I have hitherto met with no instance." He gives, however, a number of forms and of these specimens some among [464 A] would appear to come under f. *annua* (a seedling plant in its first flowering season) or f. *strictifolia*; some among [464 B] under f. *ramosissima* (much branched from the base, branches curved upwards) or possibly f. *crassicaulis* (a luxuriant state often four feet high, with stem nearly as thick as a goose quill).—W. C. Barton. "Probably right, but leaves not much rounded at the base and fruit incurved."—Adamson.

Œnothera odorata Jacq. Coast sandhills, between Aberdovey and Towyn, Merioneth, May and June, 1919. Becoming locally well-established here, and to all appearances wild, its spindle-shaped root penetrating deep into the sand. It flowers and seeds profusely.—J. Cosmo Melvill.

Carum verticillatum Koch. [469]. Boggy meadows, Colbren. W. Brecon, v.-c. 42, August 31, 1920.—W. C. Barton. "Yes, a frequent plant of wet ground among the hills of S. Wales."—Riddelsdell.

Oenanthe silaifolia Bieb. Cherwell meadows, near Aynhoe, Northants, June 14, 1920. See *Journ. Northants Nat. Hist. Soc.* 174, 1920.—G. C. DRUCE. Also from the same locality, June 28, 1920. In the meadows by the Cherwell I found it lower down the river at Somerton, Oxon, last year, and at Dr Druce's suggestion tried this locality in Northants this year, and found it there, a N.C.R. in plenty.—H. J. RIDDELSDELL.

Galium Mollugo × *verum*. Kingswood-Chipstead Lane, Surrey, v.-c. 17, July 17, 1920. A good intermediate with abortive fruit.—A. H. WOLLEY-DOD. "Yes, nearer *verum*, especially in foliage. Agrees fairly with hybrid A of Miss Armitage's paper in *New Phytologist* viii., 1909, Nos. 9 and 10."—RIDDELSDELL.

G. ———. Ratley, Warwickshire, v.-c. 37, September 29, 1920. In a quarry near Edge Hill. Clearly intermediate between *G. erectum* Huds. and *G. Mollugo* L., one link in a series which completely unites the two species, and very difficult to assign to either, though its systematic position is pretty obvious, especially if the whole gathering is considered.—H. J. RIDDELSDELL. "A somewhat diffuse form of *G. erectum* Huds. It agrees with *G. cinereum* Smith in having stem leaves 8 in a whorl and branch leaves 6, and its diffuse habit (it is *G. diffusum* Hook.), but it is kept distinct from that plant by the leaves more lanceolate than linear, and copiously reticulated with veins. *G. cinereum* is described as having them "destitute of reticulations."—WHELDON. "One of the many forms of *G. erectum* Huds. Bagnall (*Fl. Warwick.*) records it from this place."—DRUCE.

G. ———? Diseased form. West Chiltington Common, September 2, 1920.—A. WEBSTER. "*G. hercynicum* Weig., with the inflorescence disfigured by the gall, *Eriophyes galiobius*. Named by Mr Swainston."—DRUCE.

Valerianella eriocarpa Desv. Chalford, v.-c. 34, June 3, 1920. N.C.R. On a disused piece of cultivated ground near the railway and canal, the same surroundings as at Portland. The fruit shows variations paralleled in other species (*olitoria* and *dentata*). My Portland plants are nearly to quite glabrous in fruit character; these are hispid. Has the glabrous-fruited var. received a name or is the fact simply that the hairs drop off the fruit as it matures? My impression is that the fruits on the present specimens were more hispid when gathered than they are now.—H. J. RIDDELSDELL. "Yes, a most interesting find."—SALMON.

Solidago Virgaurea L. Steep side of ravine, moorland, near Carrickmine, Co. Dublin, Ireland, August 12, 1920.—C. WATERFALL.

Filago gallica L. Cornfield, Berechurch, N. Essex, v.-c. 19, November 4, 1920. In quantity in its old station where it was gathered during the autumn by Mr A. W. Trethewy.—G. C. Brown. "Yes, very acceptable."—Pearsall and Riddelsdell.

Gnaphalium sylvaticum L. Four Shire Stone, v.-c. 33, August 14, 1920. On a piece of heathland which produces *Juncus squarrosus*, *Agrostis canina* and many *Rubi*. This species is not common in E. Gloster.—H. J. Riddelsdell.

Chrysanthemum Leucanthemum L. Pasture near Alveston, W. Gloster, v.-c. 34, June 7, 1920. A pretty form when growing, as the outer ligulates have turned to tubular florets, or are in an intermediate state. See *Journ Bot.* 43, 1918.—I. M. Roper. "This plant with very short ligules and scarcely auricled leaves does not match any of my specimens. I suppose it will come under var. *pratense* Franzl."—Adamson. "Seems to come under var. *pinnatifidum* Lecoq and Lamotte (= var. *subpinnatifidum* Fernald). Heads smaller than in type and stem leaves narrowly oblong or oblanceolate, pinnatifid at the base."—Pearsall. "This is a curious teratologic condition, found in some Compositæ, when the ray-flower becomes tubular."—Druce.

Matricaria suavolens Buch. Grassy roadside, Foxrock, Co. Dublin, Ireland, August 5, 1920.—C. Waterfall. Also from cornfield, Cranborne Chase, N. Dorset, September 1920. Also seen at Milford, Hants, in August.—J. Cosmo Melvill, and at Poole, Dorset, 1904; Basingstoke, Hants, 1907.—G. C. Druce.

Senecio aquaticus Huds., forma vel var. *ornatus* Druce. [V. 797]. Near Loch Asta, Shetland, July 1920. [Sent as *spectabilis*]. See *Report* 25, 1921.—G. C. Druce. "A curious compact and hoary form looking as if it grew on drier ground than usual, though some of the most luxuriant *S. aquaticus* I ever saw grew on the dry slopes of a coal tip."—Riddelsdell. Also from Lerwick, Shetland, July 11, 1920.—R. J. Burdon. "A small series, plants considerably varying in stature, and exactly matching Dr Druce's plant."—Ed.

S. squalidus L. Waste ground, Grangetown, Cardiff, v.-c. 41, May 1920.—A. E. Wade. "Again a species extremely variable, both in foliage and size of anthode. It hybridises occasionally with *vulgaris* at Cardiff."—Riddelsdell. "Correctly named."—Druce.

S. vulgaris L., var. *radiatus* Koch. Waste ground, Grangetown, Cardiff, v.-c. 41, May 1920.—A. E. WADE. "Very common and variable about Cardiff, Bristol, etc. The length and number of rays are most inconstant."—RIDDELSDELL.

S. vulgaris L., var. Pasture at Sapperton Tunnel, v.-c. 34, June 2, 1920. Is it Trow's *erectus*?—H. J. RIDDELSDELL.

Centaurea obscura Jord. [478]. Rocky banks of River Wye, Boughrood, Radnor, v.-c. 43, August 30, 1920.—W. C. BARTON. "All the specimens included in this gathering have the habit and large globose heads of *C. obscura* Jord., under which they must be placed. The phyllary-appendages recall those of *C. nemoralis* Jord. ranging in shape as they do from subulate, lanceolate-linear. at the base of the capitulum, with the upper series lanceolate and ovate-lanceolate, the uppermost only being roundish. The appendages of *C. obscura* Jord. should be broadly ovate, roundish or reniform. The plant is certainly not *C. nemoralis* Jord., which besides the character of the linear-lanceolate phyllary-appendages, is distinguished by its smaller ovoid heads borne on more numerous branches. The appendages of this River Wye plant are black or blackish-brown, closely imbricated or spaced and then allowing the green phyllaries to be seen. The lowest series of appendages may be spreading or recurved. I associate this plant with others known to me, to which I have given a MS. varietal name denoting the resemblance to *C. nemoralis* Jord. Dr Druce has also gathered somewhat similar forms in Essex and Caithness."—BRITTON. "Yes, in addition to other characters separating it from *C. nemoralis*, Savouré emphasises the stout, erect branches, few in number. Neither this nor the next have been collected so as to show the stem-base, which in all forms of *C. obscura* is described as decumbent, in *C. nemoralis* erect."—WHELDON.

C. nigra L. (*obscura*?) [X. 783]. Twinstead, N. Essex, September 1920.—G. C. DRUCE. "This has the habit and the heads of *C. obscura* Jord., but differs by the phyllary-appendages being lanceolate or ovate-lanceolate, not broadly ovate as described by Jordan. The lower series of appendages have also a tendency to spread or to become recurved, a character that is also apparent in Mr W. C. Barton's plant from the banks of the River Wye. Although dissimilar at first view, both forms are sufficiently alike to go together as a variety under *C. obscura* Jord., and I place them with forms from Surrey, etc., that I am provisionally distinguishing by the MS. name of var. *subnemoralis*."—BRITTON. "Not typical *obscura*, although the heads are of characteristic shape and colour. Can it be *C. obscura*, var. *ramosa*, which has elongate branches and is branched to the base?"—WHELDON.

C. nemoralis Jord. [2278]. Horsley, Surrey, September 5, 1920. This is the most frequent representative of *C. nigra* L. in southern Britain, and is easily known from the allied *C. obscura* Jord. by its more branched habit, narrower leaves, ovoid heads and phyllary-appendages (excluding the teeth) of a lanceolate form. Jordan attributed to his two species different habitats, *C. nemoralis* being a plant of grassy, bushy places, and *C. obscura* preferring upland pastures.—C. E. BRITTON. "Yes, identical with Mr Barton's No. 476, but younger and more luxuriant."—WHELDON.

C. nemoralis Jord. [476]. Epsom Downs, Surrey, v.-c. 17, September 22, 1920.—W. C. BARTON. "Forms of *C. nemoralis* Jord. showing an approach to *C. microptilon* G. & G. by reason of the very narrow, spreading-erect appendages."—BRITTON. "Yes, readily distinguished from *C. decipiens* Thuill., var. *microptilon* G. & G. by the crowned achenes. In the latter they are naked."—WHELDON.

C. pratensis Thuill. Meadows, Badgeworth, Cotteswolds, E. Gloster, v.-c. 33, July 17, 1920. Mr Bucknall and I feel satisfied that this is the right name.—J. W. WHITE. "Not *C. pratensis* Thuill., but *C. nemoralis* Jord., f. *radiata*. It has no particular character to separate it from the radiant forms of *C. nemoralis* found on the Chiltern Hills and the South Downs."—BRITTON.

C. Scabiosa L., var. *Gelmii* Briq. [1841]. Hort. West Barnes, Merton, Surrey, July 1920. A further set of the cultivated plant originating at Effingham, Surrey, in which county a second locality was found last year. A very short time before his lamented death, the late Rev. E. S. Marshall informed me of his concurrence in applying this name to the Surrey plant.—C. E. BRITTON. "A beautiful set of a very welcome plant."—ED.

C. Scabiosa L., var. *spinulosa* Koch (non *C. spinulosa* Rochel). [2279]. Fallow field, Effingham, Surrey, September 5, 1920. This is a variety of the Great Knapweed, distinguished by the phyllary-appendages terminating in a slender spine about 5 mm. in length ("fimbria terminali foliolorum involucri in spinam longiusculum validiorem mutata." Koch *Syn.*). To the variety Koch referred *C. spinulosa* Roch. bann. p. 76, t. 36, f. 76, but the *Plantae Banatus rariores* shows that though allied to *C. Scabiosa* L. Rochel's plant is a well-marked species with linear, elongated leaf-segments, and the blackened area of the phyllary-appendages more confined to the apex, etc. Specimens of *C. spinulosa* Roch. from south east Europe in *Herb. Brit. Mus.* support the view that Rochel's species is quite distinct from *C. Scabiosa* L. I am not aware that

Koch's variety has previously been found in Britain, though a plant referred to *C. spinulosa* Roch. has been gathered at Gloucester Docks (*Journ. Bot.* 254, 1911). The plant distributed occurred in fair quantity among ordinary *C. Scabiosa* in a fallow field, and was otherwise distinguished by the numerous erect stems and thick, soft, dark-green leaves.—C. E. BRITTON. "Seems to agree with Koch's description of his *spinulosa*, but I have not compared my example with authentic material. The longer terminal spine to the bud; the scales drawn in *E.B.* t. 56 and Coste *Fl. Fr.* ii., p. 390, are quite different."—SALMON.

C. melitensis L. Waste ground, by maltings, Hythe Quay, Colchester, v.-c. 19, June 30, 1920. All from one large plant.—G. C. BROWN. "Yes."—DRUCE and RIDDELSDELL.

Hieracium aurantiacum L. Adderbury, v.-c. 23, June 8, 1920. In the churchyard as is frequently the case with this species.—H. J. RIDDELSDELL. "Correct, not easily mistaken."—CRYER. "This is not true *H. aurantiacum* L. but my *H. brunneo-croceum*. Vide *Journ. Bot.* 60, 1921, where these species are dealt with in detail. The specimen sent has been cut too high to show the characteristic leafy stolons."—PUGSLEY.

H. cambricum F. J. Hanb. Great Orme's Head, v.-c. 49, May 27, 1920.—J. CRYER. "Agrees exactly with my Glamorgan specimens (near Treorchy, 1903)."—RIDDELSDELL. "I agree."—PUGSLEY.

H. pachyphyllum Purchas. Symonds Yat, v.-c. 34, May 28, 1913.—H. J. RIDDELSDELL. "Correctly named."—CRYER. "I think correct."—PUGSLEY.

H. serratifrons Almq., var. *Stenstroemii* Dahlst. Cray Gill, M.-W. Yorks, v.-c. 64, July 2, 1920.—J. CRYER. "I cannot think that this plant is any form of *H. serratifrons*. It agrees closely with both Hanbury's and Linton's descriptions of *H. rivale*, particularly in the thickened peduncles and apparently obconic heads, but I am not confident that it should be so named."—PUGSLEY.

H. serratifrons Almq., var. *lepistoides* Johanns. Prinknash Park, v.-c. 33, June 26, 1912.—H. J. RIDDELSDELL. "I think so, though the leaves are not quite characteristic in my specimen."—CRYER.

H. serratifrons Almq., var. *crassiceps* Dahlst. Wall at Chalford, v.-c. 34, June 3, 1920. Agreeing with a plant growing close by named by Mr Ley as above. One of the scarcest of the *serratifrons* forms on the Cotteswolds.—H. J. RIDDELSDELL. "Probably correct, although the heads are not so large or thick as those of typical *crassiceps*."—CRYER. "This seems indistinguishable from Scotch specimens so named."—PUGSLEY.

H. serratifrons Almq., var. *cinderella* Ley. High railway banks, Glynneath Tunnel, v.-c. 41, June 17, 1911. These are seedlings. Distributed also in 1911 (see *Rep. B.E.C.* 101, 1911) without name [Ref. No. M. 20]. I feel sure it is now rightly identified. Also from Perddyn Glen, v.-c. 41, June 15, 1911—H. J. RIDDELSDELL. "Correctly named."—CRYER.

H. serratifrons Almq., var. *grandidens* Dahlst. Under trees, Amberley, v.-c. 34, June 3, 1920. I follow Ley's guidance in this determination. I believe *grandidens* is not infrequent on the Cotteswolds, at any rate in their southern half. Also from Toadomoor Woods, Stroud, E. Gloster, v.-c. 33, June 14, 1911. Coll. E. M. DAY; comm. H. J. RIDDELSDELL. Both assented to by CRYER.

H. serratifrons Almq., var. *torticeps* Dahlst. Wood, Sheepscombe, v.-c. 33, June 24, 1912.—H. J. RIDDELSDELL. "So I should name it."—CRYER.

H. subulatidens Dahlst. Origin: wall at Curt Colman, Bridgend, v.-c. 41, August 8, 1912. Named by Mr Cryer. See *Rep. B.E.C.* 575, 1916.—H. J. RIDDELSDELL. "Abnormally luxuriant as might be expected in a cultivated plant."—PUGSLEY.

H. vulgatum Fr., var. *sejunctum* W. R. L. Railway bank between Tintern and Tidenham, v.-c. 34, June 14, 1912. The plant was very distinct-looking as it grew, foliage yellowish.—H. J. RIDDELSDELL. "The clothing of the stem and the shape and clothing of the phyllaries will not do for var. *sejunctum* W. R. L. Although not typical, it is best placed under *H. diaphanoides* Lindeb., which is a variable plant. Mr Riddelsdell assents to this."—CRYER. "I do not think this should come under *H. vulgatum*. From its oval leaves and densely glandular heads the example sent seems to be very near to *H. irriguum* Fr."—PUGSLEY.

H. maculatum Sm. Railway banks at the mouth of Sapperton Tunnel, v.-c. 34, June 2, 1920. See *Rep. B.E.C.* 384, 1908. This gathering is earlier than the previous one, and does not show so well the characteristic long lower panicle branches.—H. J. RIDDELSDELL. "Yes."—CRYER. "This appears to be a form of *H. maculatum*, but it does not agree with the description in Linton's *British Hieracia* in that its peduncles are eglandular, its phyllaries only sparingly glandular, and its ligules distinctly pilose-tipped."—PUGSLEY.

H. sciaphilum Uechtr. Roadside, Hook Norton, v.-c. 23, June 26, 1920. Styles yellow, ligules slightly hairy.—H. J. RIDDELSDELL. "Yes, typical."—CRYER. "The form with pilose-tipped ligules, markedly floccose-edged phyllaries and very dark glands."—PUGSLEY. Also from various localities in Gloucestershire, etc. Mr Cryer has seen all these sheets and agrees to the name.—H. J. RIDDELSDELL.

H. sciaphilum Uechtr., forma *paucifolia*. Quarry, Radyr, v.-c. 41, June 3, 1911. Det. A. Ley. See *Rep. B.E.C.* 104, 1911.—H. J. RIDDELSDELL. "This seems to me distinct from *H. sciaphilum*, and near *H. pulchrius* Ley."—PUGSLEY.

H. sciaphilum Uechtr., var. *amplifolium* Ley. [M. 14]. Ynyscynon, Aberdare, v.-c. 41, June 11, 1911. See *Rep. B.E.C.* 105, 1911.—H. J. RIDDELSDELL. "Correctly named."—CRYER and PUGSLEY.

H. Adlerzii Almq. Banks of Menai Straits, v.-c. 49. May 28, 1920. In abundance.—J. CRYER. "Agrees remarkably with a plant from near Llanwrtyd, v.-c. 42, which I gathered in company with Ley in 1907. This had originally been put to *Adlerzii*, but in 1907 was assigned by Ley to *H. septentrionale* Arv.-Touv., var. *amphibolum* Lindeb.; and under this name it was distributed through the Club in 1907. Ley, however, left it at last in his herbarium under *Adlerzii* Almq., and to that species I believe both the Llanwrtyd and Menai plants belong. Linton's *Handbook*, however, gives a description which does not exactly fit but the differences (*e.g.*, stem leaves glabrous above, subtruncate heads, etc.) are slight."—H. J. RIDDELSDELL. "I do not think the example sent to be *H. Adlerzii*, which should have larger, more ovate and less toothed leaves. The leaf-cutting of this plant and the clothing of its heads recall *H. porrigens* Almq., but I cannot name it."—PUGSLEY.

H. corymbosum Fries. [514]. Mellte Glen, W. Brecon, v.-c. 42, August, September 2, 1920. The gathering could be separated more or less satisfactorily into two groups, of which one had leaves darker and more dentate than the other. They do not, however, correspond very well with the description in *Brit. Hier.* of either type or var. *salicifolium*. All have at least some leaves ± floccose, but even when sub-entire they are hardly less acute. The plants seemed to me to vary in leaf and habit according to soil conditions and exposure much in the way that *H. umbellatum* does.—W. C. BARTON. "I should say *corymbosum* and var. *salicifolium* (with narrow, nearly entire leaves, etc.).''—RIDDELSDELL. "There are two plants on my sheet, one of which has longer, broader, and more toothed leaves. This I put under type. The other, with smaller, more entire, and floccose leaves, is better placed to the var. *salicifolium*. Very near type.''—CRYER. This, too, is the opinion of PUGSLEY.

Hypochœris glabra L. [V. 789]. Near Byfleet, Surrey, September 1918.—G. C. DRUCE. "Yes, this is the most frequent form, the *genuina* of Godron, in which beaked and non-beaked fruits occur in the same head. It is remarkably abundant in many sandy fields in the Lower Wey drainage area.''—SALMON and WHELDON. Also from heathland, Thetford, v.-c. 26, June 4, 1920.—F. ROBINSON. "Yes, type.''—RIDDELSDELL.

Taraxacum "bercheriense,'' sp. nov. [X. 920]. Marcham, Berks, September 1920. This is *T. naevosum* Dahlst. See *Report* 29, 1920.—G. C. DRUCE.

T. lacistophyllum Dahlst. [X. 6]. Oxford, May 1920.—G. C. DRUCE.

T. ———. [X. 79]. Marcham, Berks, September, 1920. I am still awaiting a name for this handsome form.—G. C. DRUCE.

Lactuca saligna L. Abundant on a clay bank bordering the R. Ouse, Ely, Cambs., August, 1920.—T. STEPHENSON.

Sonchus asper Hill, var. [T. 47]. Wytham, Berks, July, 1920. —G. C. DRUCE. "Is *S. asper*, var. *glandulosus* Coss. & Germ.''—WHELDON. "It is a glandular form of var. *pungens* Bisch. which has come true from seed.''—DRUCE.

Lobelia Dortmanna L. [as *Isoetes*]. At the edge of Lough Magillie, east of Stranraer, W. Wigtownshire, v.-c. 74, September 28, 1883. Coll. CHAS. BAILEY; comm. G. C. DRUCE.

Limonium humile Mill. Salt marsh, The North Bull, Dublin, August 16, 1920.—C. WATERFALL. "Mr Waterfall sent me similar examples from the same locality in 1905. They come under the forma *nana* Neum. Sveriges Fl. 205, 1901.''—SALMON.

L. binervosum C. E. Salm. Drier parts of salt marsh, The North Bull, Dublin, August 16, 1920.—C. WATERFALL. "Yes.''—C. E. SALMON. Also from Barry Island, Glamorgan, July, 1920.—A. E. WADE. "This small, neat form of *S. binervosum*, with spreading spikes, simulates *Statice recurva*, but the latter has a stouter and rougher scape, different leaves, and the outer bracts longer compared to the inner, etc."—SALMON.

Primula elatior Schreb. Balsham Wood, Cambs., hybridising with *P. vulgaris*, April, 1920.—T. STEPHENSON.

P. veris L. [658]. Short, natural, shell-sandy pasture near the sea-shore, 20 feet above sea-level, links of Tuquoy, Westray, Orkney, May 29, 1920. Native, very common over several acres of the links, plants in full flower. Confirms the first record of this species from Orkney by the Rev. George Low in his *Tour through the North Isles and part of the Mainland of Orkney in the year* 1778. 10, 1915, viz. :—" Westra. In my way from the manse of Pierowall discovered Primula, foliis dentatis rugosis floribus luteis fastigiatis, probably an unique in Orkney."—H. H. JOHNSTON. " Welcome specimens from such a northerly locality. It also occurs in Sweden. The plants are slightly more farinose than the southern form."—DRUCE.

Vinca minor L., flore pleno. Big Wood, Portishead, N. Somerset, v.-c. 6, March 16, 1920.—I. M. ROPER.

Gentiana Amarella L., var. *praecox* Raf. Chanctonbury Ring, Sussex, May 30, 1920.—A. WEBSTER. " Yes, I think we should label it *G. lingulata* C. A. Agardh, var. *praecox* Towns."—SALMON.

Polemonium caeruleum L. Abundant in an old gravel pit, not very near houses, at Ollerton, Cheshire, on the road to Peover, June, 1920. I have known it to occur here annually, for the past eleven years at least, in increasing quantity. It occasionally varies here with white flowers. This summer I noticed an instance of teratology in the blue corolla becoming so abortively abbreviated that the yellow stamens became the predominant feature when the panicle was surveyed at a slight distance.—J. COSMO MELVILL.

Myosotis lutea Pers. = (*M. Balbisiana* Jord.). St Catherine's, Jersey, April, 1920.—G. C. DRUCE.

Cuscuta Epilinum DC. Twinstead, N. Essex, September, 1920. —G. C. DRUCE.

Antirrhinum Orontium L. Garden weed, Foxrock, Co. Dublin, September, 1920.—C. WATERFALL.

Scrophularia alata Gilib. Scoulton Mere, W. Norfolk, v.-c. 28, July 30, 1919.—F. ROBINSON.

Veronica scutellata L., var. *hirsuta* Weber. Pond, Donyland Heath, N. Essex, v.-c. 19, May 27, 1920.—G. C. Brown. "Yes, a good variety in my opinion, not determined by habitat."—Adamson. "Excellent examples of the var. *villosa* Schum. Enum. Pl. Saelland 7, 1801. Weber did not name it *hirsuta* but merely alluded to a hairy variety."—Druce.

V. acinifolia L. Near Milford, Surrey, June, 1920. I was directed to the spot by Mrs C. H. Wilde and Mr E. B. Bishop. See *Report* 730, 1919, and 34, 1920.—G. C. Druce.

V. verna L. Thetford Heath, v.-c. 26, May 5 and 21, 1920. Exceptionally fine and abundant this year. Coll. Miss A. B. Cobbe; comm. G. C. Druce.

Mixed gatherings and imperfect specimens of Euphrasia, in consequence of cost of printing, are not inserted.—Secretary.

Euphrasia stricta Host? [497 & 497A]. Valley of Craig y pwll du between Boughrood and Erdwood, Radnor, v.-c. 43, August 20, 1920. I believe this is identical with plants so named in the *Report*, but I am not happy about naming. I can draw no definite line between these and *nemorosa* gatherings from several parts of the country (*cf.* some under [483]) and think we are not justified in putting them to a separate species. They are, however, sufficiently distinct from the familiar *nemorosa* and the case would perhaps be met by placing them as var. *strictiformis* under *nemorosa*. It seems probable that further work may show the species *nemorosa* to be rather wide and to include several well-marked forms worth distinguishing by a varietal name.—W. C. Barton. "*E. stricta* Host."—Pearsall, Lumb and Bucknall. "The bracts have the broad non-cuneate base of *E. stricta* and I should call it that, although stems so strongly flexuose are unusual in this species."—Wheldon. "[497 A]. Yes, *E. stricta* Host."—Bucknall. "Although these examples show some likeness to *E. stricta*, I think they are really forms of *E. nemorosa*. *E. stricta* Host is recognised by Wettstein, Townsend and Chabert as identical with *E. ericetorum* Jord., and the Austrian and French exsiccata cited by these authors clearly belong to one relatively well-marked species. These specimens from Radnor differ because they lack the characteristic "strict" habit, and their branching is distinctly more basal, the teeth of their leaves and bracts are fewer and less aristate, their flowers are smaller and not of the lilac colour usually seen in *E. stricta*, and the calyces are more or less inflated and accrescent in fruit, with relatively broad teeth."—Pugsley.

E. stricta Host. Among hay-grass, near the village of Near

Sawrey, Hawkshead, N. Lancs, v.-c. 69b, August 5, 1920.—W. H. PEARSALL. "Yes, good *E. stricta* Host."—BUCKNALL. "This is quite past flowering, and all of the leaves and many of the bracts are fallen. I should certainly not call it *E. stricta.* I should judge by the very broad bracts (the lower obtusely toothed) and the accrescent fruits that it is *E. borealis.*"—PUGSLEY.

E. nemorosa H. Mart. [600]. Monks Cave, Cardiganshire, July 23, 1919, see *Rep. B.E.C.* 833, 1919.—C. V. B. MARQUAND. "As in 1919, *E. nemorosa.*"—PEARSALL, LUMB and PUGSLEY. "All certainly *brevipila.*"—BARTON.

E. nemorosa H. Mart. Llandough-juxta-Cardiff, Glamorgan, July, 1920. Coll. A. E. WADE; comm. Nat. Mus. of Wales. "*E. brevipila.*"—PEARSALL, LUMB and BARTON. "Numerous short-stalked glands are visible. The habit is that of *nemorosa.* It is a plant which I have seen in several places round Cardiff, and also in E. and W. Gloster. Mr Bucknall once placed it under *E. campestris* as var. *neglecta*, but now, I understand, he regards it as a glandular variety of *E. nemorosa.*"—RIDDELSDELL. "*E. nemorosa*, var. *ciliata.*"—WHELDON. "*E. nemorosa.*"—BUCKNALL. "I think these are varying forms of *E. nemorosa.*"—PUGSLEY. "Mr Wade's sheets were sent out exactly as received."—ED.

E. ———? [482]. Quarry grounds, Penywilt, Brecon, v.-c. 42, August 26, 1920. Short stalked glands few or none.—W. C. BARTON. "*E. nemorosa*, var. *ciliata*, sometimes with a few short glandular hairs."—PEARSALL and LUMB. "My specimen is quite eglandular. Perhaps *E. curta*, var. *glabrescens.*"—WHELDON. "Poor specimens, probably *E. nemorosa.*"—BUCKNALL and PUGSLEY. "I am not ready to admit this or any other glandular plants at present as *E. nemorosa.*"—DRABBLE.

E. nemorosa H. Mart., var. *ciliata* Drabble. [483]. Edge of quarry, Penywilt, Brecon, v.-c. 42, August 23, 1920.—W. C. BARTON. "Not hairy enough for var. *ciliata*, I think."—BUCKNALL. "I think *E. nemorosa*, var. *ciliata.*"—DRABBLE and PEARSALL. Also [491]. Craig Gleisiad, Brecon, v.-c. 42, at 1700 ft., August 25, 1920.—W. C. BARTON. "Rightly named."—PEARSALL, LUMB, WHELDON, and DRABBLE. "*E. minima* Jacq."—BUCKNALL. "I suppose a form of *E. nemorosa*, but a few of the specimens have obtuse teeth, and the bracts are peculiar."—PUGSLEY. Also [492]. Craig Gleisiad, Brecon, v.-c. 42, at 1500-1600 ft., August 25, 1920. —W. C. BARTON. "Yes."—PEARSALL. "*E. minima* Jacq."—BUCKNALL. "I think a form of *E. nemorosa*, but the habit and foliage recall *E. Kerneri.*"—PUGSLEY.

E. nemorosa H. Mart. [29]. Growing with *Bartsia viscosa* in a boggy meadow, Silverwell, v.-c. 1, August 3, 1920.—F. RILSTONE. "One of the many forms of *E. nemorosa*."—PUGSLEY and BUCKNALL. Also moorland pastures above Woody Bay, N. Devon, [A] June 20, 1920, and [B] July 14, 1920.—H. E. FOX. "[A] *E. nemorosa* H. Mart."—BUCKNALL, BARTON, and PUGSLEY. "Young *E. nemorosa*, var. *ciliata*."—PEARSALL and LUMB. "[B] Some of the flowers are brightly coloured like those of *E. Kerneri*."—BUCKNALL. "*E. nemorosa*, var. *ciliata*."—PEARSALL and LUMB. "*E. nemorosa*."—PUGSLEY and BARTON.

[Ref. Nos. 481-497]. Each of these numbers covers plants from one spot as gathered, and sheets were sent out to show as far as possible the range of plants in the gatherings. This may be more useful than any sorting of specimens. [481] included a few specimens of *brevipila* and a few glandular plants similar to eglandular ones. [482] included both eglandular plants and plants with an occasional gland; a few had several short-stalked glands. In [483] and [485-492] I failed to detect any glands.—W. C. BARTON.

E. nemorosa H. Mart., var. *ciliata* Drabble. [481]. Penywilt, Brecon, v.-c. 42, August 26, 1920.—W. C. BARTON. "Three plants, one undoubted *E. brevipila*, one glandular *E. nemorosa*, and one *E. nemorosa*, var. *ciliata*."—DRABBLE, PEARSALL, and LUMB. "Not hairy enough for var. *ciliata*."—BUCKNALL. "I agree."—PEARSALL. [485, 487-90]. Marshy ground at foot of Craig Gleisiad, Brecon, v.-c. 42, August 25, 1920.—W. C. BARTON. [485]. "*E. minima* Jacq. Branched on account of damage to main stem. Quite different from the Exmoor *E. confusa* Pugsley."—BUCKNALL. "I think rightly named."—PEARSALL, LUMB, WHELDON, and DRABBLE. "Another slender form of *E. nemorosa*, some specimens approaching in their flexuous habit the Exmoor *E. confusa*."—PUGSLEY. [487]. "Yes."—PEARSALL and LUMB. "The very small number of hairs seems hardly sufficient to justify a varietal name."—ADAMSON. [488]. "Yes."—PEARSALL and LUMB. "I think forms of *E. nemorosa*."—PUGSLEY. "*E. nemorosa* Jacq. Some of the specimens are branched because of damage to the main stem."—BUCKNALL. [489]. "Yes."—PEARSALL and LUMB. [490]. "I think a form of *E. nemorosa*."—PUGSLEY. "Type, not variety."—WHELDON. "I think *E. nemorosa*, var. *ciliata*."—DRABBLE.

E. occidentalis Wettst., var. *praecox* Bucknall. Slopes above Polperro, v.-c. 2, A—May 31, B—June 9, C—June 21, 1920. I presume these are all var. *praecox*. Early June was dry and the plants matured rapidly. By June 9 many were almost past flowering. Gathering C is from a densely crowded growth on cushions of thyme.—F. RILSTONE. "Yes, with few or many short-stalked glands."—PEARSALL and LUMB. "Apparently *E. occidentalis* with very few glands, but twice the size assigned to var. *praecox.*"—BUCKNALL and WHELDON. "I think correctly named. These three gatherings make a fine series of a plant which is rarely well represented in herbaria. The specimens show the scattered, subsessile glands more clearly than any that I have hitherto seen."—PUGSLEY.

E. confusa Pugsley. [41]. Moor near Helman Tor, v.-c. 2, alt. 500 ft., July and August 1920, and downs north of St Clear, v.-c. 2, alt. 900 ft., August 1920. Flowers white, with yellow throat. Mr Bucknall saw the Helman Tor in July, and considered it different from the Exmoor plant only in the less yellow flowers. Later I had an opportunity of submitting specimens of both gatherings to Mr Pugsley, who named both *E. confusa.*—F. RILSTONE. "Both specimens so named seem to come well within the range of *E. minima*, and Wettstein's opinion of the original Exmoor plant seems equally to apply to these, comprehended without doubt in *E. minima*; more branched, somewhat more pointed leaves and larger flowers, but these characters are not sufficient to separate it as distinct from *E. minima*, as they are all within the possible variations of that species. Should the said characters of the English plant be found to be constant, I should propose to classify it as a separate variety such as *E. minima*, f. *anglica*. Mr Pugsley considers the Exmoor plant remarkable as the only yellow-flowered *Euphrasia* found in Britain, and suggests it being a new species. We are of the opinion that much of the present confusion arises from over-emphasis by British botanists of this yellow colour and consequent lack of consideration of other colours. Mr Pugsley fails to see in it any real resemblance to *E. minima* excepting its small yellow corollas and emarginate capsules. Wettstein states that *E. minima* is a most difficult and variable species which took him five years of difficult study to thoroughly understand. He admits our plants differ from continental forms but considers their variations to come within the range of the species. So it appears to us, and we submit that the parallel polymorphism between British and continental specimens of *E. minima* is a resemblance which Mr Pugsley has overlooked. A mere glance at Wettstein's trivials—*minor*, *elatior*, *maxima*, *subaristata*, *flava*, *bicolor*, *grandiflora*, *glandulosa*, *hispidula*, *subglandulifera*, *alba*, *pallida*, and *purpurascens*—shows that the species is extremely polymorphic, and that therefore we may expect to meet with plants differing widely from those we have previously examined from any different habitat. An examination of British and continental examples of this species brings out the following points of resemblance. (a) Both are very variable in size. We have a sheet of British plants, the largest of which is 17.3 cm.—passed by Mr Bucknall as *E. minima*, f. *grandiflora*, and by Dr

Drabble as probably *minima*, found growing with undoubted *E. minima* of normal character, and Wettstein gives an even larger range (25 cm.) for continental specimens. (b) Branching is very variable in both, but more so in British examples. (Examine the figure of Jacquin's original, photographed by Wettstein. Is that little branched? Indeed is it not possibly rebranched?) We have British and Engadine examples which are rebranched. (c) The clothing of the leaves, bracts and calyces is variable in each. In either British or continental plants it may be sparse or plentiful—in extreme cases comparable to that of *E. curta*—and at times glandular. An examination of continental specimens and a study of Wettstein's trivial proves this for European examples and a microscopic investigation of British plants reveals the same diversity, and confirms Mr Hiern's description of the calyces as being more or less hispidulous, with scattered pallid hairs and sometimes with very short gland-tipped setae, or nearly glabrate. (d) The leaves may be few or many in British or continental *E. minima*, and they may also be broad or narrow. We cannot agree that they are typically subrotund or at least always distinctly broad, nor are they necessarily few in number. (e) The teeth of the leaves and bracts, however, are commonly few, ± obtuse, and at times aristate in both. (f) The spike shows wide variation in laxity or condensation in both. (g) The flowers of each exhibit almost identical diversity of size and colour. Wettstein's description of the corolla of *E. minima* and its varieties includes numerous diversities and mixtures of colours, and Mr Hiern says, 'accompanying the yellow-flowered *Euphrasia* there grew in greater abundance specimens having whitish or pale-purplish or purplish flowers.' Moreover, neither Wettstein nor Jacquin describes the corolla as having subequal lips, nor is it figured so. The amount of gape, too, varies along similar lines—the lower lip being varyingly depressed in both British and foreign examples. (h) The capsules of each show the same variation of form. In British as in continental plants we find the obovate capsule drawn by Hiern, and also the ovate-cuneate form figured by Wettstein. We have, therefore, come to the conclusion that the only difference we can see is in the more branched habit of these British plants, and that appears to us merely to indicate an ecological state rather than a distinct species."—PEARSALL and LUMB. "This seems inseparable except for its white flowers from the Exmoor plant formerly referred to *E. minima*, and described in *Journ. Bot.* lvii., 169, 1919, as *E. confusa*. In 1919 I visited Mr Marshall's locality for this plant at Simonsbath, and found that the majority of the plants there produced white and not yellow flowers. This strengthens the contention that this plant is not related to *E. minima*."—PUGSLEY.

E. Rostkoviana Hayne. Rough hillside, Polperro, v.-c. 2, June

23 [25], June 29, 1920 [26]. Except that some of these Polperro plants are much branched they represent the prevalent East Cornwall type with shaggy green leaves and small white flowers. A form with showy violet-purple flowers occurs on Caradon Hill [30] and Kit Hill.—F. Rilstone. "Yes."—Pearsall, Lumb and Wheldon. [25] "Yes."—Bucknall. "A small-flowered form with very broad fruits somewhat resembling the plant lately distributed from N. Devon as *E. fennica* Kihl."—Pugsley. "Correct."—Barton.

E. Rostkoviana Hayne. [31]. Cheesewring Downs, v.-c. 2, August 1920. Small flowered.—F. Rilstone. "Yes."—Bucknall. "This appears to be a slender form of *E. Rostkoviana*, small in all its parts and with relatively short, glandular hairs. It may be regarded as a connecting link between the form collected by Mr Barton at Myrtleberry Cleeve, N. Devon, and *E. Vigursii*. There is also one specimen of *E. nemorosa* on the sheet sent."—Pugsley.

E. Rostkoviana Hayne. [30]. Slopes of Caradon Hill, v.-c. 2, August 6, 1920. A form with showy violet-purple flowers much resembling *E. Vigursii* Davey, but with the long flexuous glandular hairs of *Rostkoviana*. It occurs sparingly with the white-flowered form—the latter plentiful.—F. Rilstone. "Agreed."—Pearsall and Lumb. "Yes, this shows the purple flowers of *E. Vigursii* with the typical hair-clothing of *E. Rostkoviana* and foliage intermediate between the two."—Pugsley and Bucknall.

E. Rostkoviana Hayne. [484]. Marshy ground below Craig Gleisiad, Brecon, v.-c. 42, August 25, 1920.—W. C. Barton. "Correct."—Pearsall, Lumb, and Bucknall. "A small-flowered slender form approaching *E. hirtella*."—Pugsley.

Melampyrum pratense L., var. *latifolium* Schueb. and Mart. Wood, Weston-in-Gordano, N. Somerset, v.-c. 6, July 29, 1920.—I. M. Roper. "Yes, a most striking plant. It seems to run down to *M. pratense* L., sub-sp. *M. vulgatum* (Pers.) Beauv., var. *vulgatum* Beck., f. *ovatum* Beauv. = *M. vulgatum* Pers., var. *ovatum* Spenner."—Adamson. "If members will turn to the *Report* 44, 1917, they will find that Beauverd has shown that the var. *latifolium* of Schueb. and Mart. (which was erroneously reported by Babington) is not known for Britain, but is of European and eu-Asian distribution."—Druce.

Orobanche elatior Sutton. In some quantity by the side of the main road between Benson and Nettlebed, v.-c. 23, July 28, 1920. Not a rare species, I believe, in Oxfordshire.—H. J. Riddelsdell. "Yes. *O. major* L., long known from this station."—Druce.

Mentha longifolia Huds. Naturalised on ditch banks, Foxrock, Co. Dublin, September 19, 1920.—C. Waterfall. "Yes."—Fraser. "A pretty form of *longifolia* near var. *rugosa* Wirtgen Menth. Rhein. It is allied to *Nicholsoniana* Strail."—Druce.

M. ———? Origin: near Bourton Downs, v.-c. 33, cult. 1920. Very much reduced in garden soil. The perfume suggests a close relation to *M. aquatica*.—H. J. Riddelsdell. "The single, rather poor stem that has come my way I can make nothing more of than *M. hirsuta*, but I should like to see fuller material. The foliage is rather more thinly hairy than usual but the specimen cannot, I think, come under Baker's *subglabra*."—Salmon. "A curious Mint with the habit of *aquatica* of which it has the bristly pedicels and therefore is taken out of the *gentilis* and *rubra* group, but it is glandular and has the agreeable scent of the *gentilis* set. Its parentage may be *aquatica* × *odorata*, the latter hybrid giving the odour, the former species the habit and clothing. The plant itself may be of old cultivation."—Druce. "A small, starved state of *M. aquatica* L., var. *hirsuta* (Huds.)."—Fraser.

M. sativa L? Braunstone Pool, near Leicester, v.-c. 55, August 1919.—A. E. Wade. "This interesting mint (but unfortunately only one whorl on my two examples is in flower, the rest being immature) seems to come under *arvensis* rather than any form of × *sativa*. It seems it might come under Baker's var. *Allionii* (*Journ. Bot.* 253, 1865), but it is scarcely the *M. Allionii* of Boreau."—Salmon. "I think a shade form of one of the *arvensis* varieties."—Druce. "*M. arvensis* L., var. *Allionii* Bor. Teeth of sepals very short; pedicels glabrous (I detected three hairs on one pedicel); stem glabrous below, hairy above; leaves nearly glabrous, hairy on nerves beneath. A broad leaved form."—Fraser.

M. cardiaca Baker. Marston brick-yards, Oxford, October 1920.—G. C. Druce. "I agree."—Fraser. "My example does not show the lower part of the stem, but it seems correctly named. The leaves are rather more hairy than in Surrey specimens examined which conform more exactly with Baker's original description."—Salmon.

Thymus ovatus Miller. (*T. Chamaedrys* Fl. Angl., non Fries). Between West Lodge and Stubhampton Bottom, Cranbourne Chase, N. Dorset, September 14, 1920. The prevailing species of Wild Thyme in the westerly portion of Cranbourne Chase. It grows here remarkably luxuriantly, far more so than I have seen elsewhere.—J. Cosmo Melvill. "Yes."—Adamson. "Yes, under var. *subcitratus* Beck."—Jackson and Barton.

T. Serpyllum L. [31]. Cold Knap, Barry, Glamorgan, July 1920.—A. E. WADE. "Of sheets seen, all under sub-var. *Linneanus* (G. & G.)."—JACKSON and BARTON. [32]. Cliff top, Barry, Glamorgan. "Some pieces under *Linneanus*, others nearer *angustifolius*."—JACKSON and BARTON. [33]. Caerphilly Common, Glamorgan, July 1920. "I suppose these must all come under *T. Serpyllum* L., sensu stricto, following Domin and Jackson in *Journ. Bot.* 1908. According to Rouy's key I bring them to *T. Chamaedrys* Fr., which Domin and Jackson regard as = *T. glaber* Mill., which does not fit these plants. With No. 33 is a small piece of a plant of a rather lighter green, and both stem and leaves very much more hairy."—ADAMSON. "Some pieces might be placed to *angustifolius*, though not extreme, others are intermediate between the two sub-vars."—JACKSON and BARTON.

Satureia montana L. Summit of ruined walls of cloisters at Beaulieu Abbey, S. Hants, v.-c. 11, July, 1920. The specimens I sent to the Club recently were gathered too late, *viz*, October. This year I have been more fortunate in obtaining them earlier. I hope, therefore, they will prove acceptable, as being in good flowering condition. For past remarks upon this plant see *Rep. B.E.C.* 573, 1919. —J. COSMO MELVILL. "A bountiful and excellently preserved supply of a very acceptable plant."—ED.

S. Calamintha Scheele. Cothill, Berks, September, 1920.—G. C. DRUCE.

S. Nepeta Scheele. Near Linton, Cambs., September, 1920.—G. C. DRUCE.

Scutellaria galericulata L. Procumbent form with white flowers. Countess Wear, Devon, v.-c. 3. A patch of this plant about two yards wide has been growing for some years on low alluvial soil on the border of a wood, occasionally liable to flooding by brackish water, and rather shaded. Tall upright plants of the ordinary form grow by the side of a ditch 50 yards away.—W. S. M. D'URBAN. "An interesting *albiflora* form, which is rare."—DRUCE.

Prunella vulgaris L., forma floribus pallidis. Origin: Badby Wood, Northants, v.-c. 32, 1913: cult. in hort., July 12, 1920. Flowers nearly white. It soon established itself in my garden and has produced a fresh generation of seedlings every year. Amongst all the plants that have flowered I have been unable to find one with a tendency to revert to the type, which is common on my own lawn as well as on a piece of common adjoining. Does this persistence of type, now maintained through seven generations under natural conditions, give the plant any title to specific rank and if not, why not? There is little to distinguish the plant from the type except a hoary appearance due to greater pubescence.—L. Cumming.

P. laciniata L. Hardwick Cambs., July, 1920. The blue form quite frequent, in large clumps, the cream form much less.—T. Stephenson.

Plantago Edmondstonii Druce. [V. 29]. Balta Sound, Unst, Shetland, July, 1920.—G. C. Druce. See *Report* 41, 1920.

P. major L. Garden weed, Putney, Surrey, August, 1920.—H. E. Fox.

Scleranthus annuus L., forma. [U. 782]. Pyrford, Surrey.—G. C. Druce.

Atriplex laciniata L. Sand dunes, North Bull, Co. Dublin, August 16, 1920.—C. Waterfall.

Suaeda maritima Moq., var. *macrocarpa* Moq. Sandy salt marsh, Burton, Cheshire, September 25, 1920. This seems to be the only variety present in this locality. I suppose that the species must be quoted as *S. maritima* Moq., following *Camb. Brit. Flora* ii.—R. S. Adamson. "The prevailing form on the Essex and Suffolk saltings, where it assumes the procumbent or erect form according to its habitat."—Ed. The older name, adopted by Britton & Brown, *Ill. Fl. North. States*, is *Dondia maritima*. *Suaeda* is conserved in the *Actes*."—Druce.

Polygonum maculatum Trimen & Dyer. Manure heap, Swalcliffe Grange, v.-c. 23, July 24, 1920.—H. J. Riddelsdell. "This is surely *lapathifolium*. Nuts too large and orbicular for *maculatum*."—Salmon. "I should place this under *P. lapathifolium* × *Persicaria*."—Adamson. "Yes, much more robust than usual, and with pinker perianths, and approaching *P. biforme* Wahl. in some respects. Too young to show fruit character. It may be a hybrid."—Wheldon.

P. (*Roberti* Lois.), = *P. Raii* Bab. Sea sands, Killiney Strand, Co. Dublin, September 7, 1920.—C. Waterfall. "*P. Roberti* Lois. and *P. Raii* Bab. are not synonymous. The former is a plant of the Mediterranean area, apparently not reaching British shores, and distinguished by its biennial or perennial root, achenes much smaller than in *P. Raii* and polished almost as much as in *P. maritimum*. The plant distributed is *P. Raii* Bab."—Britton. "Yes."—Riddelsdell. "In excellent fruit, known in this spot since 1842."—Salmon.

Rumex elongatus Guss. [2199]. By the Thames between Putney and Hammersmith Bridge, Surrey, June 29, 1920. Occurring at intervals on the banks of the River Thames from Putney to above Kew, on the Surrey side of the river. The specimens distributed are quite identical with specimens in *Herb. Brit. Mus.* collected many years ago by the late H. Trimen, who first recorded this form as a British plant. Other specimens, labelled *R. crispus*, var. *elongatus*, at South Kensington, are plainly different from the Thames-side *elongatus*, and appear to be ordinary poorly-developed *R. crispus* ("left bank of the Itchin above Southampton, August 11, 1882," Aug. Ley). or *R. crispus*, var. *trigranulatus* ("muddy tidal banks, Tintern, Mon., July 30, 1878, Aug. Ley, and also from the same locality, July 28, 1911; coll. Rev. W. Butt"). A feature of *R. elongatus* is the markedly glaucous character of the foliage.—C. E. BRITTON.

Euphorbia amygdaloides L. Woods, Dinas Powis, Glamorgan, May, 1920.—A. E. WADE.

E. virgata W. & K. Marcham, Berks, July, 1920.—G. C. DRUCE.

Mercurialis annua L. Garden weed, Glentaner, Foxrock, Co. Dublin, September, 1920.—C. WATERFALL.

M. annua L., var. *ambigua* (L.). St Helier's, Jersey, August, 1911. Coll. J. PIQUET; comm. G. C. DRUCE.

[*Populus tremula* L.], seedlings, peaty ground by Stoneycroft Beck, Cumberland, June 12, 1920.—C. WATERFALL. "Seedlings of *Betula alba*."—BRITTON & DRUCE.

Salix ———. [Q. 72]. Bletchington, Oxon, September, 1919. —G. C. DRUCE. "*S. triandra* L., f. *concolor* Wimm. et Grab."— PEARSALL.

S. aurita L. Crox Bottom, Bishopworth, N. Somerset, v.-c. 6, March 18, September 16, 1920.—I. M. ROPER. "Correct."— PEARSALL. "I agree to this, but catkins should be collected when they just come into bloom to show the true shape of the ovary and the proper length of the style."—FRASER.

S. aurita × *caprea*. (*S. capreola* J. Kern.). Birchwood Lane, Houndstreet, N. Somerset, v.-c. 6, April 24, 1920.—I. M. ROPER. "Probably so, stipules smaller than usual."—PEARSALL. "The catkins are too old and the leaves too young for forming a proper estimate of this."—FRASER.

Hydrilla verticillata Casp. Esthwaite Water, N. Lancs, v.-c. 69b, August 4, 1920. See *Rep. B.E.C.* 167, 1914. This has very considerably increased since its discovery in 1914, and the members of the British Ecological Society saw it under most favourable conditions during their recent visit. Upon ecological grounds *Potamogeton praelongus* was expected to make its appearance in the same water, and was duly discovered here for the first time on July 23, 1920.—W. H. PEARSALL. "Beautiful specimens, fully equal to those contributed in previous years by Mr Pearsall."—ED.

Helleborine palustris Schrank. Sandhills, Pendine Burrows, Carmarthenshire, August 1, 1919.—C. V. B. MARQUAND.

Epipactis atroviridis W. R. Linton. [2245]. Wood by Fetcham Downs, Surrey, August 4, 1920. All the specimens included in the set of plants contributed exhibited the essential characters of *E. atroviridis.* Since the plants were gathered the Messrs Stephenson have published their view that W. R. Linton's plant is not a valid species, and should be merged into *E. latifolia* and the name allowed to lapse. After an acquaintance with *E. atroviridis* in several Surrey localities, I am in full agreement with this conclusion.—C. E. BRITTON. "The leaf-type of this fine specimen is very much more orbicular than that of Linton's plate. That would not be in itself a matter of importance, but we doubt the distinctiveness of this species. We should call the plant *latifolia.*" —T. & A. STEPHENSON. "So I should name it."—CRYER. "Varying somewhat in stature but agreeing in flower characters throughout the gathering."—ED.

E. viridiflora Reichb., var. *leptochila* Godfery. Near Woodchester, W. Gloster, July 26, 1920. These examples agree well with Col. Godfery's description of his variety and with specimens from the original locality. On close examination the reproductive organs were seen to be adapted for self-fertilisation, the rostellum being invisible in the open flower. Examples of the labellum were dissected out and pressed separately to show the characteristic form, and a packet containing these is placed with every sheet. See *Journ. Bot.* 20, 1921.—C. E. SALMON. "An interesting and important identification, which throws much light on difficulties which I have found in this genus as represented in Gloster."—RIDDELSDELL. "A perfectly homogeneous gathering which is most welcome."—ED. "I am sorry to see these plants appear under *Epipactis.* Elsewhere I have shown that the true generic name is *Helleborine*, and this is adopted in the *British Museum List* by Rendle and Britton and by Lindman, Schinz, Thellung, and other recent workers. Moreover, *Epipactis* dates from Adanson's *Famille des Plantes*, a work put under an interdict in the *Cambridge Flora.*"—DRUCE.

Orchis morio L., forma *Churchillii* Druce. Marshy pastures near St Ouen's Pond, Jersey, April, 1920. See *Report* 47, 1920.—G. C. DRUCE.

O. Fuchsii Druce. Wytham Wood, Berks. July, 1920.—G. C. DRUCE. "A robust habit, with typical broad lowest leaf, and side lobes of leaf much crenulate."—T. & A. STEPHENSON. "All plants typical."—ED.

O. laxiflora Lam. St Ouen's, Jersey, June, 1902. Coll. F. PIQUET; comm. G. C. DRUCE.

Narcissus Pseudo-Narcissus L., var. *lobularis* Haw. Tenby, Pembrokeshire. Coll. W. GUNTER, 1917; comm. Nat. Mus. of Wales. "Correct."—ED.

Juncus subnodulosus Schrank. R. Windrush, above Bourton, at the 7 Springs, v.-c. 33, September 4, 1920. A very late flowerer. Very local in Gloucestershire.—H. J. RIDDELSDELL. "Yes, rather immature."—ADAMSON.

J. Kochii F. Schultz. Peaty common, Sulham, Surrey, June 21, 1920.—R. J. BURDON. "My specimen has only three stamens and must come under *J. bulbosus* L. (*J. supinus* Moench)."—ADAMSON. "Prof. Glück considers that the number of stamens is not a decisive character. He named similar specimens *Kochii.*"—DRUCE.

J. squarrosus L. Four Shire Stone, v.-c. 33, August 14, 1920. The only locality in E. Gloster, I believe.—H. J. RIDDELSDELL.

J. bufonius L., forma. Waste ground, Bradford, v.-c. 64, July 30, 1920.—J. CRYER. "This is a distinct-looking form of dry places with the inner perianth only just exceeding the capsule. I do not think it is constant."—ADAMSON.

Potamogeton natans L. A very abundant and common form in slow peaty streams in N. Lancs. Nearly choking the Kirkby "Pool" at Wreak's Bridge, N. Lancs, v.-c. 69b, September 28, 1920.—W. H. PEARSALL. "Nearest the var. *ovalifolius* of Fieber."—BENNETT.

P. polygonifolius Pourr. [1696]. Semi-terrestrial state. Sphagnum bog, Tiptree Heath, N. Essex, v.-c. 19, May 16, 1920. Exposed leaves firmer in texture, no fruit present.—G. C. BROWN. "I hardly understand Mr Brown's 'firmer texture.' As a rule *polygonifolius* has much thicker leaves than these have, even in the floating state. The leaves are remarkable for their tenuity as a 'semi-terrestrial' form, and the nervation is peculiar and much more like *coloratus* than *polygonifolius*, but there is no fruit, and Mr Brown (*in litt.*) has never seen it fruiting. *P. polygonifolius* is given for Tiptree Heath in Gibson's *Flora of Essex* 333, 1862."—Bennett. "Yes."—Pearsall.

P. perfoliatus L. Coniston Lake, N. Lancs, v.-c. 69b, August 21, 1920. This is var. *lanceolatus* Blytt or, according to Dr Hagström, var. *gracilis* Ch. et Schl., f. *lanceolatus* Blytt. Abundant at the north end of Coniston and rapidly increasing in Esthwaite Water, 5 miles distant.—W. H. Pearsall. "A very pretty translucent-leaved form that approaches the *oblongifolia* of Mertens and Koch *Fl. Deut.* 1823. It is somewhat between that and the var. *lanceolatus* Blytt, but *perfoliatus* over its area of growth is so variable that it is difficult to name many forms absolutely. Hagström *Crit. Res. Pot.* 256, has γ *oblongus* Spenner (β *oblongifolius* Dum.), but both are later than Mertens and Koch's name of 1823."—Bennett.

× *P. Lintoni* Fryer. In the Canal near Lichfield, Stafford, last July, when botanising with Sir Roger Curtis we noticed a pondweed growing in masses, specimens of which are now distributed. With it grew *P. crispus* and *mucronatus* Schrad. (*Friesii*), and although not quite the same form as the original *Lintoni* from the Chesterfield Canal in Derbyshire, yet I could suggest no other possible combination. Specimens have been sent to Dr Hagström and he assents to the determination *P. crispus* × *mucronatus*. It is the second known locality in Britain. Like the original one it grows in canal-water with a rather high percentage of dissolved or suspended mineral constituents from the passing canal-boats stirring up mud. Perhaps it is this strain upon the life-factor of the parents that has caused them to cross. When a plant nears its extreme range of latitude or altitude or is placed under additional stress I suspect the mutual sterility or objection to cross becomes lessened or breaks down so that these curious crosses occur. Like other hybrids it is vegetatively very vigorous.—G. C. Druce. "*P. crispus* × *Friesii* (Index) in Hagström's *Crit. Res. on Potamogeton*. Ascherson and Graebner in *Das Pflanzenreich* 133, 1907, make it *crispus* × *mucronatus*, while the original was *P. Friesii* × *crispus*. It varies somewhat in breadth of leaf, Dr Druce's specimens being the widest, and with a deeper tint of red prevailing. On present knowledge it is confined to the British Isles. A new record for Stafford, v.-c. 39. It is evident that this is nearer *crispus* than the other British specimens."—Bennett. "Correctly named, most interesting."—Pearsall.

P. obtusifolius M. & K. [446.] Pool on heathland. Stow

Bedon, v.-c. 28, August 19, 1920.—F. Robinson. "The usual form of these places, and closely resembling an original specimen sent by M. Koch in 1824 in De Candolle's herbarium at Geneva. Queried for W. Norfolk in *Top. Bot.* 415, 1883, but found by Canon Bullock-Webster in September 1897."—Bennett. "Correct."—Pearsall.

P. rutilus Wolfg. Loch of Tingwall, Shetland, August 1920.—G. C. Druce. "I think this is a narrow-leaved form of the plant in habit more like the *P. caespitosus* of Nolte Reich. *Ic. Fl. G. et Helv.* vii., 15, t. 23, f. 41, 1845, *Hansen Herb. ex* No. 1007 (1843). It differs from most of the specimens of *rutilus*, by the narrower leaves, shorter internodes, and smaller spikes. I have types of both."—Bennett. "*P. rutilus*, teste Hagström."—Druce. "Yes, this removes the ? in *Potamogetons of Brit. Isles* 83."—Pearsall.

P. ——? [× 1012]. Thames, near Eynsham, Oxon, October, 1920.—G. C. Druce. "Probably the autumn state of *P. flabellatus* Bab."—Bennett. "Only a young shoot of *P. pectinatus*."—Pearsall. "Hagström rejects *flabellatus* as a species and calls this robust plant *pectinatus*, forma *pinguis*."—Druce.

P. pectinatus L. Brackish pools, Burton salt marsh, Cheshire, v.-c. 58, June 30, 1920.—C. Waterfall. "A form of *P. pectinatus*, but not enough to refer to any named form."—Bennett. "Yes, var. *ungulatus* Hagstr."—Pearsall.

Zannichellia pedunculata Reichb. Dyke in meadows, Virley, N. Essex, v.-c. 19, May 20, 1920.—G. C. Brown. "It seems to me that the name for the plant with a general as well as partial peduncles is *Z. pedicellata* Fries Fl. Danica, t. 2610."—Bennett. "Yes, better under *Z. palustris* L."—Pearsall.

Alisma ——? Edge of pond by Grand Junction Canal, Tring, Herts, August 24, 1920. Is this *A. arcuatum* Mich.? Plant about 3 ft. high. All the specimens are from one tuft. All branches of the inflorescence are umbellate; carpels bisulcate on back; leaves narrowed at both ends.—R. S. Adamson. "*A. arcuatum* Mich. is described as having, *inter alia*, the branches of the stem recurved. In Mr Adamson's specimen before me this point is not easy to see but some of the pedicels are arcuate. I should have thought my example was *A. lanceolatum* With."—Salmon. "Not at all like my Spanish *arcuatum*."—Druce.

Eriophorum latifolium Hoppe. [480]. Boggy ground west of Torpantau Station, Brecon, v.-c. 42, N.C.R., August 19, 1920. In

Journ. Bot. 146, 1885, Mr W. Bowles Barrett records:—"An interesting plant with downy peduncles in a mountain bog, about 500 feet above and on the west side of Torpantau Railway Station. Mr J. G. Baker remarks that it has the peduncles and fruit, but not the leaves of *E. gracile* Koch." I examined a large number of plants in the locality from every piece of boggy ground within some distance. Most were *E. angustifolium*, but at the spot indicated was growing this form with scabrid peduncles, unfortunately in poor condition owing to heavy rains. I have little doubt this is the plant recorded above, but the specimens now distributed will, I think, make it clear that the record should be *E. latifolium* Hoppe.—W. C. Barton. "Although the specimens were gathered too late, and are thus poor, yet the habit is of the above plant, certainly not *E. gracile* Koch, and I think Mr Barton is justified in naming it as he does."—Bennett. "I have a Breconshire (Craig Cille) specimen which I gathered in September 1903."—Riddelsdell.

Carex lasiocarpa Ehrh. Shores of Esthwaite Water, N. Lancs, v.-c. 69b, August 6, 1920. In open patches among the reed-swamps, usually associated with *C. rostrata* Stokes, which grows in slightly shallower water. The lake was much higher than usual, the plants past their best, and therefore very soft below. It was almost impossible to pull up entire plants from 3 ft. of water. None possessed more than 2 fertile spikes and these were usually not obtuse. —W. H. Pearsall. "On record for Westmorland, but it seems quite well that Mr Pearsall suggests that Lake Lancashire should be separately recorded under v.-c. 69b."—Bennett.

C. Oederi Retz. [445]. Shore of Loch Tay, Fearnan, Perth June, 1920.—F. Robinson. "Correct."—Bennett. "This comes under *C. flava* L. = *C. flava* L., var. *oedocarpa* Körn."—Adamson.

C. ericetorum Poll. Roadside, Eriswell, v.-c. 26, May 20, 1920. —F. Robinson. "In good fruit, the peculiar fringing of the glumes disappears to a great extent as the plant fruits, but when in flower it is most distinct, and at once separates it from *C. caryophyllea*, which it was at first taken for when gathered in Cambridgeshire."—Bennett. "Yes."—Adamson. "My flowering example is most characteristic."—Ed.

C. montana L. Park Gate Forest, Isle of Wight, N.C.R. Found, March, 1920.—G. C. Druce. "It shows the mildness of the climate. I have never seen it in flower in cultivation before April 3rd."—Bennett.

C. tomentosa L. Near Marston Maisey, Wilts, June, 1906.—G.

C. DRUCE. "Good specimens with the characteristic stolons, which it largely develops in cultivation."—BENNETT.

C. flacca Schreb., var. vel forma. Buckland Hills, Surrey, v.-c. 17, June 11, 1920. In this form the female spikelets are shortly pedicelled and more or less erect, giving so different an appearance to the plant that I at first sight took it for a tall *C. Goodenowii*. It does not agree with either *C. erythrostachys* And., or *C. serrulata* Biv. On some plants it was mixed with the type, so it can hardly be more than a state.—A. H. WOLLEY-DOD. "This seems to be practically the same as the Thorpe Green (Surrey) plant that I distributed through the Club in 1911 (*Report* 134), though these examples are rather taller and more luxuriant and the female spikes not so approximate. The upright fruiting spikes give the plant a distinct appearance. I could not find a name for the plant in 1911, nor can I now."—SALMON. "The spikes are rather more erect, and the fruit is arranged in a more regular manner than usual, but beyond this I do not see any difference."—BENNETT. "The more correct name is *C. diversicolor* Crantz, a most variable species, of which I consider this only a form as yet undescribed."—DRUCE.

C. limosa L. Brookhouse Moors, between Holmes Chapel and Congleton, Cheshire, June 29, 1881. Coll. T. Rogers. A rumour having reached me that the interesting locality named above either has been or is about to be reclaimed, prompts me to forward to the Club all the specimens I have in duplicate, collected there nearly 40 years ago by the late Mr Rogers.—J. COSMO MELVILL. "Lord de Tabley observes in the *Flora of Cheshire* 328, 1899, 'The Knutsford plant differs from the Brookhouse one: the former is exactly typical *limosa*; the latter getting on to *C. irrigua*.' An additional Cheshire station for *limosa* is 'Wybunbury, 1906, gathered by Mr A. H. Evans.'"—BENNETT. "I gathered it at Wybunbury with Mr Evans. This had broader leaves than the type."—DRUCE.

C. salina Wahlb. By the Wick River, Caithness, August, 1920. —G. C. DRUCE. "This member of the *salina* group of Carices is treated by Finnish and Swedish botanists as under *C. salina* × *cuspidata* a *kattegatensis* Fries. Some Swedish authors associate it with *C. haematolepis* Drejer, but the original plant from Greenland figured in *Flora Danica* t. 2370 differs as Lange shows in *Nor. Fl. Danica* 139, 1887, where he contrasts it with *kattegatensis*, *cryptocarpa* and others. It is a more slender plant, with the spikes on longer peduncles, &c. *C. kattegatensis* is a rare plant occurring in Finland, in Norway near Christiansand, and in the two Swedish provinces of Halland and Bohuslan. Recent alterations at Wick have destroyed much of the Carex, but it is still in plenty higher up the river, to Sibster three miles up. It is found almost entirely on the north bank of the river, but occurs sparsely on the south, near the Milton Burn. For its distribution see *Ann Scot. Nat. Hist.* 179, 1904."—BENNETT. "Lindman considers it only a form *kattegatensis* of the sub-species *cuspidata*. I got these specimens with a very robust form of *aquatilis* on the south side of the river."—DRUCE.

C. divulsa Stokes. Waste ground by roadside, Lambourne Hill, v.-c. 1, June, 1920.—F. RILSTONE. "Correct."—BENNETT.

C. diandra Schrank. Darkadale, Orkney, August, 1920, N.C.R. See *Report* 54, 1920.—G. C. DRUCE.

C. divisa Huds. Bank of the tidal Avon at Rownham, below Bristol, N. Somerset, v.-c. 6, June 25, 1920. Extremely rare in the county although there would appear to be many suitable localities along the Bristol Channel and its tidal affluents. The spot whence the present gathering was obtained had been enclosed for ten years or so within a high fence of the "White City" in Ashton Fields, and the plant thus protected from traffic. It is a rather weak form, approaching var. *chaetophylla* Daveau.—J. W. WHITE. "In flower and good condition."—BENNETT. "Yes."—ADAMSON.

Mibora minima Desv. (*M. verna* Beauv.). Fallow field, Monthéry near Paris, April 15, 1911. I send a few sheets of this plant from a continental locality for comparison with the much smaller form which I have already distributed from Guernsey, and the still smaller plant of the Anglesea sandhills.—C. V. B. MARQUAND.

Agrostis canina L. With other heathland species at Four Shire Stone, v.-c. 33, August 14, 1920. There is only one previous trustworthy record for E. Gloster, "Heath, Windrush," in *Herb. St. Brody*.—H. J. RIDDELSDELL.

Calamagrostis [*lanceolata* Roth]. Wicken Fen, Cambs., July, 1920.—T. STEPHENSON. "Surely *C. epigeios* Roth."—DRUCE. "All *C. epigeios*."—ED.

Deyeuxia strigosa Kunth. Marsh, Loch Watten, Caithness, August, 1920.—R. J. BURDON. "This is not the true *strigosa* of which at present we lack an authentic record for Britain. This is a form of *D. neglecta* Kunth. The true *strigosa* is considered by Hackel to be a hybrid of *epigeios* (which does not occur in the area) and *stricta*. These specimens are not quite my var. *scotica* which has longer and more longly acuminate glumes and a more diffuse panicle."—DRUCE.

Aira aggregata Timeroy. [2222]. Cultivated field, Chelsham, Surrey, July 25, 1920. This is allied to, but is not identical with *A. multiculmis* Dum., which is to be recognised by its erect, spreading panicle branches, whereas in Timeroy's plant the panicle has widely spreading or divaricate branches. Both agree and are to be distinguished from forms of *A. caryophyllea* in the long naked panicle branches with the spikelets clustered at the extremities. *A. aggregata* is a more elegant plant than *A. caryophyllea* and attains a taller stature, reaching in favourable seasons about 18 inches high. Owing to the dry season of the spring of 1920 this grass failed to attain the luxuriance it showed in previous years. The locality in which it grew was a cultivated field situate on the pebbly beds of the lower London Tertiaries.—C. E. Britton. "Under *A. multiculmis* Dum. Are the two separable? Husnot *Gram.* treats them as synonymous and Rouy reduces *A. aggregata* to a var. of *A. multiculmis.*"—Adamson.

Holcus mollis L., forma. Shady bank in open, Withington, Manchester, July 25, 1920. This looks very different from the ordinary woodland form of the species.—R. S. Adamson. "A handsome form such as I have seen in damp sandy woods under shady conditions, or is it more?"—Druce. "I found a shade form in the Belgian forest area exactly resembling this."—Ed.

Trisetum flavescens Beauv. Benslow, Hitchin, Herts, v.-c. 20, June 22, 1920.—J. E. Little.

Koeleria cristata Pers. Cliffs, north of Peel, Isle of Man, July 6, 1920. A form between type and var. *britannica* Domin. It approaches Welsh plants referred to *K. albescens* but the leaves are less enrolled and they are not villous as are those of specimens in my herbarium named by Domin.—J. A. Wheldon.

K. gracilis Pers. [1752]. Chalk pit, Somersham, E. Suffolk, v.-c. 25, June 17, 1920.—G. C. Brown.

Poa polynoda Parn., var. *denticulata* Parn. Wymondley Road, Hitchin, Herts, v.-c. 20, June 21, 1920. Flowering glumes not webbed, denticulate on midrib. Dr Druce writes:—"According to description the plant must be near to *P. polynoda*, var. *denticulata*. Babington got this from Oxford, but I could never induce Hackel to pronounce it other than a form of *compressa*. Your plants, however, are more slender and graceful."—J. E. Little.

P. bulbosa L., forma *vivipara*. Shingle beach, Barry, Glamorgan. Coll. A. E. Wade, May, 1920; comm. Nat. Mus. of Wales. "I distributed it from Barry in 1906-07. Native."—Riddelsdell.

Glyceria maritima Wahl. × *procumbens* Dum., nov. hybrid [T. 194]. Near Chichester Harbour, W. Sussex, growing with the putative parents, July, 1920. Only two or three plants. They differ from any form of *maritima* in the wiry stem and narrow spikelets arranged in a very open panicle with stiff branches. The lower part of the stem has somewhat arcuate internodes. From *procumbens* it is distinguished by its more erect growth, larger size, and larger spikelets, and in facies it looks a good intermediate which I do not think has been previously described. Some authorities use *Atropis* as the generic name. Our plant is then *A. maritima* × *procumbens.* Holmberg, however, rejects the trivial *maritima* for our common seashore species, and if his view is correct it must be *A. spectabilis* × *procumbens.* Holmberg and other botanists reject both *Glyceria* and *Atropis* and use *Puccianella* = *P. maritima* vel × *procumbens.*"—G. C. DRUCE.

Lolium perenne L., forma. Taplow, Bucks, June 19, 1920.—A. WEBSTER. "Placed by Hackel under var. *cristatum* Doell."—RIDDELSDELL. "A poor state of the var. *compressum* Sibth."—DRUCE.

Agropyron repens Beauv., forma *trichorrhachis* Rohland? Wymondley Road, Hitchin, Herts, v.-c. 20, July, 1920. The sheets now sent have the flowering glume shortly awned and would apparently come under var. *dumetorum* Gray. But the character of a hairy rachis may also in this neighbourhood be seen upon plants with flowering glume acute but un-awned which corresponds to var. *arvense* Schrank. Between the latter, however, and var. *barbatum* Duval-Jouve we appear to have a connecting series.—J. E. LITTLE.

Ceterach officinarum DC. Old walls near Rush, Co. Dublin, September 15, 1920.—C. WATERFALL.

Cystopteris fragilis Bernh. On a wall at Bray, Berks, v.-c. 22, April 25, 1920. Probably introduced deliberately.—H. J. RIDDELSDELL. "Yes, a very rare plant in Berks, in which county it is doubtless adventive. It was first recorded by Mr Cope in 1911 from Finchhampstead. I omitted to include it in the *Suppl. to Berkshire Flora.*"—DRUCE.

Botrychium Lunaria Sw. Field below Fron Henlog, near Wrexham, Denbigh, v.-c. 50, June 2, 1920.— C. WATERFALL.

Azolla filiculoides Lam. In quantity in R. Ouse at Ely, Cambs., July, 1920.—T. STEPHENSON.

Nitella opaca Agardh. Winter state, in about a foot of water in a mill-stream at Harbertonford, S. Devon, v.-c. 3, February 1, 1918.—C. V. B. MARQUAND. "No doubt correct, the dactyls being definitely mucronate, but I never feel quite happy in discriminating *N. opaca* from *N. flexilis* when sterile."—GROVES.

N. [*flexilis* Agardh]. Flooded cart track, The Lizard, W. Cornwall, May 6, 1920.—C. V. B. MARQUAND. "*N. opaca* Agardh, ♀ and ♂."—GROVES.

Chara [*aspera* Willd]. Small quarry pool, The Lizard, W. Cornwall, May 5, 1920.—C. V. B. MARQUAND. "*C. canescens* Loiseleur = *C. crinita* Wallroth."—GROVES.

C. fragifera Durieu. Quarry pool on the Lizard Downs, W. Cornwall, May 5, 1920.—C. V. B. MARQUAND. "It is interesting to have the earlier state of this plant which is usually collected in late autumn."—GROVES.

CORRECTION IN DISTRIBUTOR'S REPORT 1912, *p.* 273.

With reference to "*Euphrasia curta* Wettst., var. b. *glabrescens* Wettst., damp pasture on hillside, 300 ft. above sea level, Wart Hill, Hoy, Orkney, August 15, 1912. . . . H. H. Johnston," in *Rep. B.E.C.* 273, 1912, I gathered more specimens on September 1, 1919, and July 31, 1920, and forwarded them to Mr Cedric Bucknall, who (November 13, 1920) says,—"*E caerulea* Tausch. I have compared this carefully with Wettstein's description in *Bot. Zeitschrift* 95, 1894, and still believe that it is correctly so named." This identification cancels *E. curta* Wettst., var. b. *glabrescens* Wettst., as above cited, and removes the ? before Orkney in line 13 from bottom of page 12 of *British Euphrasiae*, 1917, by Cedric Bucknall. In my specimens of *E. caerulea* Tausch the stem is simple, or rarely with one, two or four branches below the middle; leaves 2-10 toothed; and corolla lilac (not violet or violet-blue), with dark purple lines, and a yellow spot on throat of lower lip.—H. H. JOHNSTON.

In *Rep. B.E.C.* 272, 1912, line 18 from top of page, after "Orkney, July 19, 1912," *add* the Rev. E. S. Marshall writes:—".

ADDITIONAL NOTES FOR DISTRIBUTOR'S REPORT FOR 1916.

Salix cinerea × *viminalis* = *S. Smithiana* Willd. S. Croxton, 1916.—Horwood. "The catkins of this are large enough for *S. acuminata* Sm., a hybrid of uncertain origin. The leaves supplied are too young and undeveloped, but the degree of hairiness and the rounded base mentioned by Mr Pearsall are also suggestive of *S. acuminata*."—J. Fraser.

S. cinerea L., f. *oleifolia* (Sm.). Nailsea, 1919, I. M. Roper. "I agree, but the leaves would have shown their characters better if collected in August or September."—J. Fraser.

S. aurita × *cinerea* = *S. lutescens* A. Kern. Shirehampton, 1919.—I. M. Roper. "This seems rightly named."—J. Fraser.

S. aurita × *caprea* = *S. capreola* J. Kern. Minera Lime Works, 1919.—C. Waterfall. "This seems to be *S. aurita* × *caprea*, but catkins would have been evidence in the adult state. *S. caprea* is often stunted in dry chalky situations and, even when quite typical generally, may have glabrous leaves on some of the shoots or branches."—J. Fraser.

CORRECTION IN DISTRIBUTOR'S REPORT 1919, *p.* 815.

Rubus [*calvatus*]. Mr Riddelsdell writes, August 1920:—"Your [435] is *villicaulis* not *calvatus*. The same form is in Rogers' herbarium with the name corrected from *calvatus*."—W. C. Barton.

ADDENDA.

Rumex paraguayensis Parodi [verus autor est E. Munk], in Anal. Soc. Cient. Argent. v., 160, 1878, et Contrib. Fl. Paraguay ii., 52, 1878. E. grege *R. pulchri* L. s. lat. Descr. emend.: saepius humilis, parce ramosus ramis erecto-patentibus. Folia inferiora breviter petiolata. ovato-elliptica vel ovato-oblonga (nec panduriformia), obtusiuscula, margine subtiliter undulato-crispulata. Florum verticillastra omnia folio conspicuo obovato-elliptico (basi

magis sensim attenuato quam apice) acuto suffulta, densa et satis multiflora. Pedicellus perigonio fructifero subaequilongus, plerumque paullo infra medium articulatus. Sepala interiora fructifera triangulari-ovata, latitudini aequilonga vel paullo longiora, apice acuta, valde reticulata et foveolata, omnia callifera callo rubelloflavido oblongo valde undulato-granuloso-crenato, margine dentata dentibus utrinque 2—5 subulato-setaceis apice subrectis vel leviter incurvato-hamatis longitudine valde variabilibus (diametrum sepali longitudine subaequantibus usque ultra duplo brevioribus) interdum bifidis. Differt a *R. pulchro* L. : caulo non divaricato-ramoso; foliis integris (nec panduriformibus) latioribus, superioribus (et bractealibus) ad formam oblongo-spathulatam tendentibus; pedicellis fructiferis longioribus (perigonio subaequilongis); sepalorum interiorum multo magis acutorum dentibus plerumque longioribus gracilioribus multo minus rigidis subsetaceis, callo etiam crassiore valde undulato-crenato. Differt a *R. dentato* L. : foliis latioribus ad formam obovatam tendentibus, nequa-quam panduriformibus; sepalis interioribus latioribus in utroque latere calli huic aequilatis vel latioribus valde reticulato-foveolatis, callo valde undulato-crenato. Valde affinis quoque videtur *R. nipponicus* Franchet et Savatier Enum. Pl. Japon. ii., 471, 1879 (= *R. pulcher* Franchet et Savatier, *l.c.* i.; [1875] 393, nec L.) e Japonia, qui tantem differt: foliis angustioribus, inferioribus ± panduriformibus, superioribus et bractealibus ± lanceolatis (basi magis subito contractis quam apice), verticillastris superioribus subaphyllis, callo sublaevi minore (dimidiam longitudinem sepali vix attingente).—Hab.—in America australi, Paraguay: Cordillere, ad domos (sec. Parodi, *l.c.*); Argentina: Posadas (Misiones, ad limites Paraguay), leg. L. Naboulet, November 1918; comm. L. Hauman). Introd. in Angliam (vide infra) et in Germaniam (Prov. Rhenana: Essen, Neuss, Emmerich, Verdingen, introd. verisim cum seminibus oleaginosis, 1911-16, leg. Bonte) et in Hollandiam: Wornerveer, prope fabricam farinarum, 1915 (leg. A. W. Kloos).—A. Thellung.

Angl.: Elland [B. 73], coll. E. C. Horrell: comm. G. C. Druce, i., 1918. Tingley, York [B. 79], comm. G. C. Druce, vi., 1918. Ware, Herts, coll. 1914: comm. G. C. Druce, 1918. Glasgow, R. Grierson, August, 1920. Bristol, Noel Sandwith, 1920: comm. G. C. Druce, iv., 1921.

Tillaea aquatica L. was discovered on September 1, 1921, by Mr R. W. Butcher, on the mud-margin of a piece of water at Adel, near Leeds, growing with *Limosella*. The Secretary visited the locality with the fortunate discoverer on September 17, and the plant appears to be native. Details will be given in next *Report*.

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(WITH BALANCE-SHEET FOR 1920)

BY THE

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G CLARIDGE DRUCE, LL.D.,

CORRESPONDING MEMBER OF THE BOTANICAL SOCIETY
OF CZECHOSLOVENSKA.

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Strong pressure has been made to bring out interim reports, but for the present such a plan is impracticable.

Thanks are accorded to Mr G. C. Brown for promptly distributing 27 parcels to the Exchange Members, containing, as they did, 4837 specimens, and for editing the *Report*.

The year 1920 was an annus mirabilis in the history of Botany—not within remembrance have we had one with so small a rainfall. The result has been that many marshes are dried up, as are many of the smaller streams: bogs which in normal years were too treacherous to walk over have become so dry as to be easily negotiable, but the botanical results have been poor. The annuals soon perished; the marsh perennials, with few exceptions, were in poor condition, while the deficiency in the flower of the hawthorn led to the natural result of a paucity of haws, and thus postponed critical work. On the other hand, the Roses were beautiful and set fruit in plenty, and the Blackberries had indeed a plenteous crop : never have I seen such enormous clusters as those which the hedges of Kerry exhibited this autumn, not only in numbers but in the size of the berries. There were but few Sloes.

We have remarked upon the poor botany the year has afforded, but Mr Butcher's splendid discovery of a new British and Linnean species is in itself enough to make 1921 memorable. It is most encouraging to see that the possibilities of the British Flora are not yet exhausted, and that our young botanists have been able to make such splendid additions as *Tillaea* and *Scorzonera*. Bryology is outside our limits, yet one cannot help but allude to the finding of *Octodiceras*, that minute aquatic Moss, in Oxfordshire this year by our youngest member, Paul Richards, a lad of 11. Other important discoveries are *Limosella aquatica*, var. *tenuifolia*, found by Mr Gambier-Parry and Mr D. A. Jones in Merioneth, and the Lizard Orchis by two Girl Guides in Berkshire, and by Mr Shrubbe in Cambridgeshire. Miss Hillard, despite her affliction, has made several records in Hayling Island, of which the rare *Lythrum Hyssopifolia* is one of the best. Our veteran member, the Rev. Prebendary H. E. Fox, has discovered *Cucubalus baccifer* in North Devon ; Miss Vachell has added *Elatine hexandra* to Glamorgan ; Mr C. V. Marquand, *Thlaspi alpestre* to Cardigan ; while Miss Todd has found *Ludvigia* in a new locality in Hampshire.

Death has robbed us of an old and ardent field botanist, the author of a most excellent *Flora of North-West Yorkshire*, Dr F. Arnold Lees, who died on the very day we gathered *Tillaea* in the locality where he once found *Limosella*. Mr R. A. Rolfe, of Kew, an authority upon epiphytal Orchids, and Mr Drummond, another of the excellent workers at Kew, have also passed away, as has Mr W. P. Evans, J.P., of Liverpool, Mr W. Whitwell, and Canon Lett. The very close of the year robbed us of Mr Cedric Bucknall, whom we could ill spare. Alnar Fiet, the curator of the Botanic Garden, Groningen, Holland, for 41 years, and the editor of *Floralia*, died on February 21.

The output of Botanical books has been below the average—nor need we wonder when the exorbitant price of printing is taken into consideration. Under the aegis of Sir David Prain a fifth Supplement of the *Index Kewensis* has been issued, treating of the years 1911-16, and we must congratulate the staff who have completed the laborious work. A monumental work on the Wheat Plant, by Prof. J. Percival, the outcome of many years' arduous toil, has also been published.

After an existence of 134 years, Messrs Reeve & Co. found it necessary during 1921 to discontinue the publication of *The Botanical Magazine*. It was originally started by Mr William Curtis, the author of the splendid *Flora Londinensis*, the publication of which nearly ruined him. He had a botanic garden in Lambeth Marsh, in which George Don was probably employed. In 1787 he started *The Botanical Magazine* in monthly parts, each with three coloured plates, for which 1/- was charged. By 1799 the sales increased to 3000 copies a month. On the death of Curtis, Dr John Sims became editor, but the sales were not kept up, and in 1827 Sir W. Hooker succeeded to the editorship. Mr H. Fitch, who had been brought from Glasgow, where he had been employed by a firm of calico printers, then became draughtsman, and to his skill we owe 3000 excellent plates. Sir Joseph Hooker's daughter (afterwards Lady Thiselton Dyer) drew the plates for some years, when the office was taken by Miss M. Smith, who has only recently retired from her work at Kew. At the cessation of the Magazine it seemed possible that the copyright, like so many other good things, would be acquired by the United States, but, with others, Mr H. J. Elwes, Mr Lionel Rothschild, and Mr Reginald Cory temporarily acquired it, and after failing to treat with the Board of Agriculture so that it should be issued under the auspices of Kew, it was offered to the Council of the Royal Horticultural Society, under whose aegis we trust that this historic and valuable work may be continued with even greater success.

We have to offer our sincerest good wishes to Sir David Prain on his retirement from Kew Gardens, an institution over which he has so ably presided for 17 years. Those years included the trying period of the great war, which personally took such a heavy toll from him in the loss of his son, and yet the work of the Department went on despite the diminished staff and all the evils that came in the war's wake. It was no easy task to fill the position once occupied by Hooker, but it can assuredly be said that Sir David exceeded even the golden opinions he had already won, and that he leaves it with an enhanced reputation and with the respect and affection of every one with whom he has been brought in contact. The heartiest greetings are offered to his successor, Captain A. W. Hill, M.A., F.R.S., who has for some years acted as Assistant-Director. We hear, too, with regret that Sir I. Bayley Balfour contemplates retirement from the Royal Botanic Gardens, Edinburgh, and that Dr Otto Stapf is nearing the end of his service at Kew, where his great abilities as a systematist will be sadly missed. The year, too, witnesses the retirement from Glasnevin Botanic Gardens, after forty-two years of uninterrupted work, never marred by a single day's illness, of its very competent controller, Sir Frederick Moore, one of the original holders of the Victoria Medal of Honour in Horticulture. The good wishes of our members go with these eminent co-workers in their future years. Professor Adolf Engler retired on April 1 from the Directorship of the Botanic Garden and Museum at Dahlem, Berlin, an office he had held for over 30 years. Congratulations are offered to Mr I. B. Pole Evans, of the Department of Agriculture of the Union of South Africa, on his knighthood, and to Dr R. R. Gates on his appointment to the Chair of Botany at King's College, London, in the place of Prof. Bottomley. It is pleasing to notice that Mr John Nugent Fitch has received a yearly Civil List Pension of £75 in recognition of his services to Botany, Natural History, and Horticulture. Mr R. V. Sherring, whose help we have had ungrudgingly, has met with a pleasing recognition of his services by the presentation of the Gold Medal from the Bournemouth Natural Science Society, an honour well deserved, as Mr Sherring had assiduously collected in Jamaica, his name being connected with five new species, and he had given much material to the Herbarium at Bournemouth, which, with Miss C. A. Roper, he had been instrumental in founding.

A complete set of our *Reports* have been sent to the Library at

Louvain, and the Rector, through the Librarian, has written a warm letter of thanks to the members for their gift. In June last, when at that ancient University, I gathered that it would be well to defer sending a series of British Plants as an offering of our profound sympathy until the rebuilding of Louvain had made further progress. A set of our *Reports* have also been sent to Vienna in memory of the services rendered to the Society in past times by Prof. Hackel, Dr R. A. von Kerner, and Dr R. von Wettstein.

We are under great obligations to Dr S. H. Vines for kindly translating Dr Murr's paper on *Chenopodium*, and for other literary help. So, too, we are most grateful to the Rev. F. Bennett, Messrs W. H. Pearsall, D. Lumb, C. E. Britton, C. V. Marquand, Mr T. Gambier-Parry, and to Mr and Mrs Corstorphine for their ready and kind assistance; to Sir D. Prain and Dr A. B. Rendle for permission to consult the collections under their care; to the Editor of the *Naturalist* for the loan of the block of *Tillaea*. Our gratitude is also warmly offered to our foreign confreres, highly skilled specialists as they are, who have so kindly determined plants for us, especially to Dr Albert Thellung, Prof. C. H. Ostenfeld, Prof. Chodat, Prof. C. Lindman, Drs E. Jorgensen, J. O. Hagstrom, E. Almquist, and J. Murr.

We condole with Prof. Craib on the accident he met with at Perth last summer, but rejoice that he escaped from the more serious consequences which might have ensued.

Our new members for the year 1921 include the Hon. Mrs Adeane, Colonel Dr G. V. Blackford, Mr R. W. Butcher, Viscount Bryce, O.M.; Mr J. Campbell (1922); Sir J. Colman, M.A., D.L.; Mrs Dent, Dr H. Downes, Mr Clarence Elliott, Mr and Mrs J. Farrer, Mr R. J. Flintoff, Mr John R. Foggitt, Mr J. Fraser, Sir R. Godlee (1922); Viscount Grey, K.G.; Mr J. W. Haines, Rev. Henry H. Harvey; Captain A. Hill, F.R.S. (1922); Dr Daydon Jackson, Mr J. Jeyes, Rev. J. de C. Laffan, Mr J. F. M. M'Gill, the Hon. Mrs R. M'Kenna, Miss E. Noel, Miss Honor Pennycoste, Miss Lucy E. Richards, Dr F. S. Salisbury, Dr Saxby, Dr O. Stapf (1922), Prof. E. S. Troup (1922), Dr Starr, Mr R. L. Smith, Rev. F. Turreff, Sir Harry James Veitch, V.M.H. (1922); Mr F. J. Wall, Major Bates van de Weyer, Miss Wilkinson, Mr R. H. Williamson, Miss Gertrude Young, and Mr F. S. Young.

My own wanderings, after a visit to Paris and Chartres, and to Sussex and the Isle of Wight for *Leucojum pulchellum*, led me to Jersey, where a rather ungenial and a very dry spring led to a paucity of plants, and, with the exception of the Gorse, a poor display of blossom. There, despite close search, I could see nothing of *Ranunculus Aleae*, although I had the company of Mr Attenborough, who took me over the ground where it was supposed to have been gathered. The var. *dunensis* of *bulbosus* was in good condition, but no cormless plants were obtainable. I spent part of May at Wilsford, under Salisbury Plain, where the Chalk Milkwort was in magnificent growth and *Orchis ustulata* in good show. Our own lush meadows of the Thames (the adjective is now scarcely fitting) afforded such masses of *Orchis incarnata* as had never been seen there before by me, *O. praetermissa* being relatively scarcer. *O. Simia* was good and in fair quantity. In June I motored to Bangor and climbed Carnedd Dafydd, crossing over from Llyn Ogwen to Bethesda in search of an *Ajuga* recorded by Johnson in 1641. All I could find was a scionless form of *A. reptans*, which may have been the form he observed, but my search was much retarded by its being —such is luck—one of the wet days of the year, and the mountain above 1000 feet was covered in wet mist. In crossing over the stream which separates the counties of Carnarvon and Merioneth *Scirpus nanus* was seen in the latter county. At Harlech our member, Mr D. A. Jones, kindly showed us *Habenaria albida* growing in upland pasture, in beautiful condition. Nearer Barmouth, at Llanaber, an extensive marsh yielded a most magnificent growth of *Orchis praetermissa*, with *maculata* and numerous hybrids, as well as the large-flowered *maculata*, var. *macroglossa*. At the embouchure of the pass of Aberglaslyn, near Tremadoc, a marshy field had beautiful specimens of *Orchis purpurella*, nor did I see other species there. Some new county records were made at Welshpool. Several fields in Worcestershire showed masses of *Crepis biennis*, a western spreading species. Having had a fortnight in Belgium visiting the Ardennes and making some local excursions in our Midlands, on the 10th of July we started for Skye and climbed the Cuchullin to see once more *Arabis alpina* in the old locality, but it was just over flower. The heat was great and the flies numerous. There I met an old acquaintance, the well-known alpine climber, Dr Norman Collie. *Orchis* *praetermissa* and its var. *pulchella*, and its hybrid with *maculata*, were locally common, but it was a poor year for grasses and sedges in Scotland. A short visit was made to Dundee, where some interesting aliens were found, in company with Mr and Mrs Corstorphine. In Kincardineshire I showed Prebendary Burdon *Cystopteris Dickieana* still growing there, and then we went north to Lerwick, where, with Mrs Wedgwood, the special plants of the Mainland were seen, including the Hawkweeds *zetlandicum*, *subtruncatum*, *protractum*, and *Rhinanthus groenlandicus*. Then Prebendary Burdon and T. Churchill accompanied me to Unst, where some strenuous work was accomplished. By the end of a month, including those seen in the preceding year, I had noted 425 species, many, of course, adventitious. This visit resulted in adding *Melampyrum pratense*, *Tolypella nidifica*, *Chara contraria*, and some other species to the flora. In September a short visit was made to Counties Wexford, Kerry, Galway, and Clare, but the trenched roads and other amenities prevented Mrs Wedgwood and myself from exploring Brandon and Sligo. The visit enabled me to find *Potamogeton coloratus*, growing with *P. lanceolatus*, var. *hibernicus*, and thus to corroborate the brilliant suggestion of Dr Hagström as to its parentage. A hybrid of *Pinguicula vulgaris* and *grandiflora* was found by the Roughty River in Kerry, where *Hieracium Scullyi* grows in its only known locality. On my return a flying visit was made to Leeds, where Mr R. W. Butcher kindly showed me *Tillaea aquatica* in a locality where it seems to be native. Bradford was visited, and Mr Cryer was good enough to show me the very rich growth of aliens, including some new species he has recently found there. Owing to the kindness of Mr Pickard we were enabled to see *Silene italica* growing plentifully near Greenhithe in Kent. It has been wrongly reported extinct. In the Erith marshes *Taraxacum naevosum* was observed. Essex was also visited, and Mr Brown kindly took Mrs Wedgwood and myself to Virley to see a *Rumex* which is closely related to *R. aquaticus*, but *Filago gallica* did not appear this season. During the year I was enabled to see about 1570 species in Britain at an age which may perhaps exculpate me from the censure this gossip justly deserves, and at 71 was enabled to climb two hills over 3000 feet in altitude.

PLANT NOTES, ETC., FOR 1921.

(*Mostly New Plants to the British Isles*).

ABBREVIATIONS.—† before a name signifies the plant is not native; × = a hybrid; ! after a locality, that the Secretary has seen the plant there; brackets [ ] that the plant is not British or the record is doubtful; *Gard. Chron.* = *Gardeners' Chronicle*; *Journ. Bot.* = *Journal of Botany*; *Nat.* = *The Naturalist.*

†28 (2). RANUNCULUS CORDIGERUS Viv. Fl. Cors., n. 8. Alien, Corsica and Sardinia. Espartal. Leith Docks, 1921, J. FRASER. A pretty plant, closely related to *R. sardous*, of which Rouy & Foucaud (*Fl. Fr.* i., 109) make it a sub-species. Archangeli (*Fl. Ital.* 239, 1894) makes it a variety under *R. Philonotis*, but Nyman (*Consp.* 14) keeps it distinct as an endemic species of the two Mediterranean Islands.

142. CARDAMINE PRATENSIS L., var. PALUSTRIS (Peterm.). J. F. in the *Gard. Chron.* 67, 1821, notes that, while usually sterile, he found it in June on a clay soil which in winter was inundated but was dry in the summer, and it set seeds in some plenty. This accords with my experience. Fruiting specimens are not rarely present on dry, sloping, grassy ground on upland pastures; that is, a deficiency in moisture leads to fertility. I was somewhat surprised to see it fruiting in damp places during the inclement summer of 1921 in the far northern Unst in the Shetlands, but it is a plant which stretches into high northern latitudes.

†222. BRASSICA GALLICA (Willd.). *Sisymbrium gallicum* Willd. Enum. Hort. Berol. ii., 678, 1809, according to Schinz & Thellung (*l.c.* 280), affords an earlier trivial than *Pollichii*, under which it appears in the *British Plant List.* If retained in the genus *Brassica* it must therefore stand as *Brassica gallica* (Willd.), comb. nov. Schinz & Thellung put it in the genus *Erucastrum* as *E. gallicum.*

It is also the *Brassica ochroleuca* Soyer-Willemet. The synonymy is greatly involved.

232. CAPSELLA B.-P. (L.) RHENANA E. At. (I. p. 71; II. p. 72, Class VII.). Leaves in summer and autumn strongly marked, lunulate. as in *Rep. B.E.C.* plate 4, p. 195, 1920. Rosettes numerous, sometimes budding, not very able to withstand frost. Capsules cuneiform. with almost straight lateral margins. 6-7 by 4 mm., notch insignificant; sa. similar. From Reimsbach on the Rhine, cultivated. Similar plants from Brussels. The species agrees with *C. germanica*, but has longer capsules and strikingly lunulate leaves. E. ALMQUIST.

BURSA PASTORIS. Studien über Capsella—II., Ernst Almquist, with 16 photos; pp. 41-93, Acta Horti Bergiana, band 7, n. 2; Upsala, 1921. In this are described with many figures 196 "species," under 12 groups—1, CONCAVIFORMES, in which are *Druceana*, *patagonica*, *anglica*; 2, SCIOLIOTICAE; 3, RUBELLIFORMES; 4, CORCULATAE; 5, CORDATAE; 6, OTITES, with *C. bremensis*; 7, CUNEOLATA, with *germanica*, *trevirorum*, *rhenana*, *viminalis*, from Watton, Norfolk (Robinson); 8, TRIANGULARES; 9, HETEROCARPAE; 10, LANCEOLATAE; 11, CONVEXAE, with *Brittonii*; 12, HIANTES, with *batavorum*.

†252. IBERIS AMARA L., forma HORTENSIS. A showy plant which was found in some quantity by Mr T. GAMBIER-PARRY in a field at Headington, Oxford, in 1920. The flowers are larger and the style longer than in the ordinary cornfield plant.

255. HUTCHINSIA (Br.) in Ait. Schinz und Thellung (*l.c.*, 289) state that the genus *Hutchinsia*, established by Robert Brown, consists of two distinct genera :—First, the true *Hutchinsia* with *alpina* as the type, and second, *Hornungia*, established by Reichenbach in 1837, which includes as its type the British *H. petraea* as *Hornungia petraea* Reichb. Fl. Deutsch. i., Kreuzbl. i., 33, 1837-9, et Ic. Fl. Germ. et Helv. ii., 27, 1837, vel 8. Brown's third species in the genus was *Thlaspi rotundifolium*. A closely-related genus, also European, is the *Hymenolobus* of Nuttall, which is placed by Nyman (*Consp.* 66) in the section *Hinterhubera* under *Hutchinsia*. Bobart (*Raii Syn. App.* 236, 1690) gives *Nasturtiolum montanum annuum* from Bristol. This is the *Lepidium petraeum* L., and S. F. Gray

(*Nat. Arr. Br. Pl.* ii., 692, 1821) established the genus on this species and on it alone as *Nasturtiolum*, thus 16 years earlier than Reichenbach's genus *Hornungia*. It is true there is an earlier *Nasturtiolum*, that of Medikus of 1792, but his name was still-born, representing as it does the much earlier *Coronopus*, hence it appears reasonable, if a change of name is necessary, to reaffirm *Nasturtiolum* (Bobart) S. F. Gray with the species *N. petraeum* (L.).

292. VIOLA MONTANA L. (*V. nemoralis* Kutz. = *V. Ruppii* All.) Wilmott has argued that Linnaeus' *V. montana* of 1753 corresponds in the main to the subsequent *V. elatior* Fries (1828), and that it was so regarded by the contemporaries of Linnaeus, and he does not regard the geographical restriction made by Linnaeus himself (the Lapland plant being *V. stricta* auct.—our *V. montana*) as a valid solution of the comprehensive species *V. montana*. He suggests *V. elatior* Fr. should be called *V. montana* L., and *V. montana* auct. rec. be called *V. Ruppii* All. Schinz & Thellung (*l.c.*, 295) do not agree. They follow Becker and Burnat in the view that the name *V. montana*, if retained at all, can only be applied to *V. Ruppii* (*V. stricta* auct.) if hopeless confusion is to be avoided. Burnat and Briquet rightly point out that there is a reason why the name *V. montana*—though it is ambiguous and has been variously interpreted —should not fall out, namely, the fact that the next oldest name, *V. Ruppii* All. (1774), covers *V. stagnina* in part and has been so used, whereas the name *V. stricta*, which is often used for our *V. montana*, originally (Hornemann, 1815) indicated *V. stagnina* Kit. (1814). Schinz & Thellung (*l.c.*, 295) cannot admit a change of name as far as the Swiss Flora is concerned, because of the numerous non-hybrid forms intermediate to *V. canina*, which indicate that *V. montana* cannot be continued as a species but must be regarded as a sub-species of *V. canina* L., sub-sp. *Ruppii* All. pro spec., pro parte = Gaudin sub *V. montana* pro parte Schinz & Thell. comb. nov., for Fries (1828) contrary to the statement of Becker (1917) did not constitute a *V. montana*, sub-sp. *montana*, but a var. of *montana*.

308. POLYGALA SERPYLLIFOLIA J. A. C. Hose in Usteri Ann. d. Bot. 21, stuck 39, 1797, vice *P. serpyllacea* Weihe in Flora ix., 745, 1826, testibus Schinz & Thellung, *l.c.*, 294, with the varieties *mutabilis* (Dumort.), *major* (Rouy & Fouc.), and *vincoides* (Chodat).

†315. FRANKENIA PULVERULENTA L. See "The Dubious Plants of Britain," *Rep. B.E.C.* 746, 1919. Lately there has come into my possession a specimen of this species from "the ballast heaps, Birkenhead, Cheshire," gathered there in July 1869 by Mr H. S. Fisher. It is not mentioned in the *Flora of Cheshire* and is an alien. of course.

350 (2). SILENE STRICTA L. Alien, W. Europe, N. Africa. Maryburgh, Lanark, with *S. annulata*. Det. at Kew. R. GRIERSON Very like *S. Muscipula*, but with longer, more acute and ciliate calyx teeth, and smaller auriculate petals.

†355. S. ITALICA Pers. Syn. i., 498, 1805. The first British record is in the *Eng. Bot. Suppl.*. No. 2748. 1832, as *S. patens*, on the authority of William Peete, who says he found it at Dover, Kent, in 1825. (*S. nutans* also grows there.) Syme (*Eng. Bot.* ii., 66, 1864) records it from between Dartford and Darenth, apparently perfectly wild on roadsides and in chalky ground, and also says it occurs on Salisbury Crags, Edinburgh. In the *Flora of Kent* 6, it is also given from Darenth Wood. Mill found it at Greenhithe in 1863, and J. C. Melvill says it is "quite wild," and he found it abundantly in 1869-71. W. W. Reeves is cited as the authority for its occurrence in the lane leading from Dartford to Darenth Wood, and Wolley-Dod found it on the roadside between Dartford and Lane End in 1888-9. Unfortunately, the Rev. E. S. Marshall in this work confused *S. dubia* with *S. italica*, and the remainder of the localities cited in the Kentish Flora refer to *dubia*, not to *italica*. Babington (*Man.* 55. 1904) considers it an escape, and Hooker (*Student's Flora*) puts it among the "excluded species." In the *Cambridge Flora* (iii., 81) it is unfigured and bracketed—in the same way as the fugitive *S. dichotoma*—and is said to be rare or extinct. No mention is made of the Edinburgh locality. Syme's description is stated to be only *italica* in part, but it seems to be made with Syme's usual accuracy, and the reproduced figure is from the original plate. Nor can one accept the sweeping assertion that *italica* has been by British botanists greatly confused with the varieties of *nutans*. although it is clear that in the isolated instance of *Flora of Kent* such is the case. In *Hayward's Pocket Book* it is kept as a distinct species. *S. italica*

is a native of Portugal and the south of Europe, and can scarcely be accorded native grade. That acute Yorkshire worker, Mr J. F. Pickard, visited the district of Greenhithe in 1920 and discovered the plant growing in considerable quantity. He kindly gave me two separate localities in which he found it. In October 1921, accompanied by Mrs Wedgwood, I visited the place and found *italica* in considerable abundance on a chalk-bank and in two chalk quarries. It grew in such luxuriance as to show it was no recent immigrant—indeed, it has the appearance of being native—but its continental distribution (Portugal and South Europe) is against its indigenity, and *Kentranthus ruber* and *Cheiranthus Cheiri* were in the vicinity. We may, however, still claim it as a well-established plant whose mode of origin is conjectural. The erect or ascending peduncles and the ripe capsule scarcely protruding from the clavate calyx mark it at once from forms of *S. nutans*.

412. SPERGULARIA MARGINATA Kitt., var. GLANDULOSA Druce. In *Journ. Bot.* 130. 1921. Mr H. W. Pugsley describes a new forma *glabrescens* Pugsl., a name which indicates its characters. It occurs in Kent, at Dover and Lydden Spout; Dorset, at Winspit; in Carnarvon, at Llanfairfechan; Devon, Plym Estuary; Norfolk, Hunstanton; and Walney Island; also in Fife, Burntisland; Nairn; Forfar, Auchmithie; and Kirkibost, North Uist.

†460 (4). ABUTILON THEOPHRASTI Medikus Malvenfam. 28, 1787, supplants the later *A. Avicennae* of Gaertner (*Fruct.* ii., 251, 1791). The sentimental feeling for the retention of the trivial *Avicennae*, given in honour of the great Arabian botanist Avicenna or Ibn Sina, is to a great extent overcome when the earlier name chosen by Medikus commemorates the father of botany.

488 (2). GERANIUM PURPUREUM Vill. Mr A. J. Wilmott (*Journ. Bot.* 93, 1821) demonstrates the distinctness as a species of Villars' plant, which he states is synonymous with *G. modestum* Jord., recorded in these pages by Clement Reid (*Rep. B.E.C.* 429, 1909), which occurs in the Channel Isles!, Cornwall!, Devon!, Dorset, Somerset, Waterford, and Cork. He gives the name var. *Forsteri* to Forster's plant in *E.B.S.* 2648, 1830, from Middleton and Stokes Bay, Sussex. He also describes var. *intermedium* Wilmott from

Dorset (see *Rep. B.E.C.* 240, 1912, Chesil Beach, Riddelsdell); Porlock, Somerset; Lynton Foreland, Devon; and Barry, Glamorgan. He also records a hybrid *G. Robertianum* × *purpureum* which appeared spontaneously in his garden.

†513. IMPATIENS GLANDULIFERA Royle. Mr Britten (*Journ. Bot.* 264, 1921) states that as a varietal trivial *candida* must replace *alba* (which he suggested, *l.c.*, 201, 1920) as it was figured and described by Lindley *Bot. Register*, t. 20, 1841, as *I. candida*. It is doubtful whether even a varietal rank is not too high for a mere colour variation, although when the colour form is perpetuated for several generations by seed it may perhaps claim it.

537. ULEX EUROPAEUS L. The vitality of seeds buried for 26 years is asserted in *Nature* 492, 1921, by J. PARKIN.

†552 (2). TRIGONELLA MARITIMA Del. Alien, Ital. mer., Sardinia, Afr. bor., Palestine. Leith Docks, 1920, J. FRASER.

†574 (2). MEDICAGO MUREX Willd. Alien, Eur. mer. Leith, Midlothian, J. FRASER.

†641 (3). ANTHYLLIS TETRAPHYLLA L. Alien, Reg. Medit. Carinal. Radyr, Glamorgan, 1921, R. L. SMITH. I am responsible for the identification of this striking species, a frequent plant on the coasts of the Mediterranean.

†*Gen.* 144 (2). DORYCNIUM (Tourn.) Scop. Fl. Carn., ed. 2, ii., 287. *Bonjeana* Reichb. Fl. Germ. Excurs. 507, 1832.

†643 (5). D. HIRSUTUM Ser. in DC. Prod. ii., 208. Alien, Eur. mer. et or. Carinal. Radyr, Glamorgan, 1921, R. L. SMITH. Identified by G. C. DRUCE.

†644 (3). LOTUS BIFLORUS Desr. in Lam. Enc. iii., 604. Alien, Ital. mer. Espartal. An endemic species put under the genus *Tetragonolobus* by Seringe. Leith Docks, plentiful in 1921, J. FRASER.

†649 (5). L. ORNITHOPODIOIDES L. Alien, Eur. mer. Carinal. Radyr, Glamorgan, August 10, 1921, R. L. SMITH.

923. Rosae Musei Regni Suecici in Methodum Naturalem Redactae Arkiv. för Bot., by S. Almquist. pp. 51, tab. 8. Stockholm, 1920. In this critical paper Dr Almquist has grouped the Roses in 11 sections—1, Semiherbaceae; 2, Subtropicae; 3, Systylae; 4, Humidicolae; 5, Glareicolae; 6, Protafzelianae; 7, Gallicae; 8, Villosae; 9, Tomentosae; 10, Afzelianae; and 11, Caninae. He gives three names to characterise glandulosity—1, Epiboladenses, "sunt glandulae superficiales (rarius etiam in pagina superiore sitae": supra, ff.), vulgo etiam rami ± glandulosae; 2, Craspedadenses, sunt glandulae marginales; 3, Anadenae, glandulis carent. A clavis and figures of the leaves are given, and 378 species are defined. Of these in the various types the following are given for Britain, though not as yet included in our Lists, the bracketted names only being in our Floras:—Type 1, Rubeae—*R. Leffleri* At., *R. bicaucasica* At., *R.* sub-sp. *incanescens* H. Br., (*aciphylla* Rau), and sub-sp. *trichardala*. Type 2, Rufulae—(*R. stylosa*), *R. brachiata* Déség., *R. infra-rufula* At., (*R. Forsteri* Sm.), *R. glauci-accurrens* At. Type 3, Subcristatae—*R. lenifolia* Mtss., (*R. subcristata*), *R. Dingleri* At., *R. syringifolia* Mtss. Type 4, Jebei—*R. molliglaucigera* At., (*obovata* Baker, *R. tomentosa* Sm.), *R. bi-Borreri* At., *R. Jebei* At., (*arvatica* Baker), *R. colpogena* At., sub-sp. *tricho-colpogena* At. Type 5, Wahlenbergii; Type 6, Acmenophyllae; and Type 7, Gabrielssonii—none. Type 8, Saturellae—*R. Swarziana* Fr. Type 9, Opaciformis—*R. glauci-pellita* At., *R. opaciformis* Mtss., *R. Loennquistiorum* At., (*R. jundzillana* Bess. ?, *R. trachyphylla* Rau). Type 10, Extensifrontis—none. Type 11, Traenii—(*R. pimpinellifolia* and *rubella* Sm.), *R. anti-Traenii* At. Type 12, Orbicantes—sub-sp. *R. molli-orbicans* At., *R. glutinosa* Sibth. & Sm., sub-sp. *glabri-Borreri*, (*Borreri* Woods). Type 13, Decurtatae—*R. repens* Scop., (*R. caerulea* Woods, *R. arvensis* Huds., *R. micrantha* Sm.), *R. decurtatella* At. Type 14, Nubilascentis—none. Type 15, Caninellae—none. Type 16, Gravetii—(*R. obtusifolia*). Type 17, Conniventes—sub-sp. *obscura* Pug. Type 18, Cuneatulae—*R. molli-indutula* At., *R. quasidumetorum* At. Type 19, Podolicae—*R. Matssonii* At. Type 20, Prolatulae—(*R. evanida* Baker). Type 21, Insertae—sub-sp. *R. macracena* Mtss., *R. cheshiriensis*, (*rubiginosa*). Type 22, Pineliensis—sub-sp. *molli-pineliensis* At., (*scabriuscula* Woods, and *Woodsiana*), *R. semi-*

scabriuscula At., *R. scabratella* At., *R. bohemica* H. Br., *R. glaucina* Rip., sub-sp. *R. affinis* Rau, *R. chlorina* At., sub-sp. *R. pratensis* Ach. Type 23, Contractae—sub-sp. *caryophyllaceae* Bess., *R. nudatella* Mtss. Type 24, Acutiformis (includes *pomifera*, is not given from Brit.)—(*agrestis* Savi), *R. glaucamphibola* At., *R. amphibola* Dgl. & Oz. Type 25, Rigidae—*R. heterophylla* Woods, (*R. senticosa* Ach.), sub-sp. *rigidiformis* At. Type 26, Chavini—(*tomentella* Lem.) *R. luxemburgiana* Crép. Type 27, Acharii—*R. permollis* At., *R. Klukii* Bess., *R. Acharii* (*R. caesia* Sm., *R. sylvicola* Rip.), *R. quasi-Acharii* At., sub-sp. *Roffarieri* Chaub., *R. quasi-sylvicola* At., sub-sp. *anglica* At., (orig. spec. in Hb. Univ. Upsala). Type 28, Hailstonei—(*R. Lintonii* At., *R. Hailstonei* Bak.), sub-sp. *fuscatula* Mtss., *R. gnophora* Mtss., sub-sp. *trichognophora* At., *R. dolata* At. Type 29, Flavidifoliae—none. Type 30, Laetocolarantis—none. Type 31, Lindstroemii—*R. normanniana* At., *R. quasi-Lindstroemii* At., *R. retecta* Mtss. In the 8 tables there are 44 squares, the 11 spaces on the top being the names of the different sections. The 4 side spaces are occupied by the type-names. Each of these is in four divisions, designated "gl." = glauca glabra; "glf." = glaucae hirtae (glauciformis); "vir." = viridis glabrae; "virf." = viridis hirtae (virentiformis), so that each table has room for 704 possible names. On table 5, for instance, *obtusifolia* comes in the last column headed "Canina Craspedadenae Epiboladenae," the space in the side column being marked "Type Gravetii," of which it belongs to "virf." division.

929 (2). Rosa—group aciculatae. One of the forms of this group, a handsome plant with very long aciculi on the peduncle, with leaves glabrous above and doubly serrate, was found on the borders of Whittlebury Forest, Northamptonshire, in October last, when it was too late to obtain satisfactory specimens. The fruits were large and the sepals persistent.

950. R. spinosissima × Eglanteria, forma cantiana (Wolley-Dod), under *R. spinosissima* × *rubiginosa* in Journ. Bot. 178, 1921, from Boxley Warren, Kent; Roxburgh, Haddington, and E. Perth.

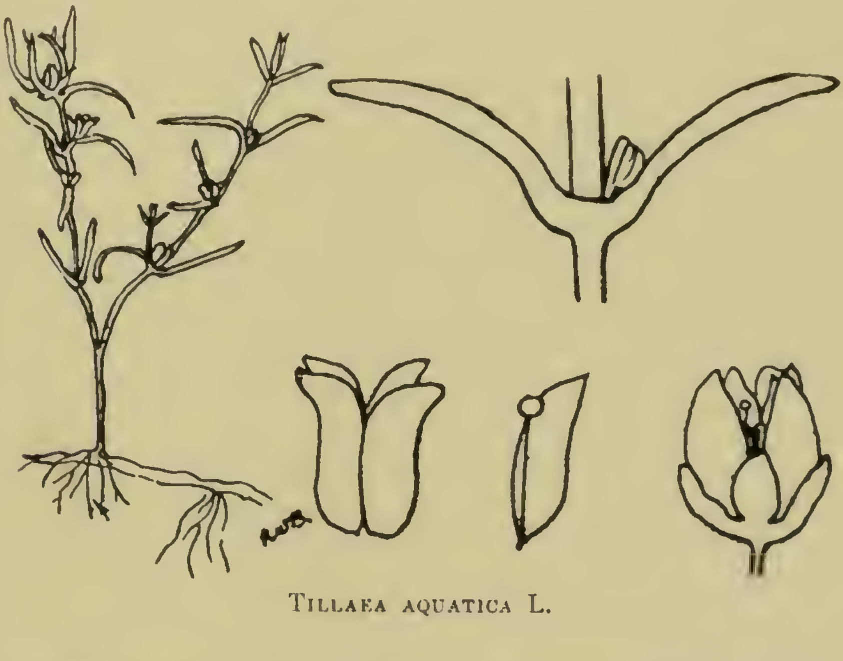
The Genus Rosa: Its Hybridology and Other Genetical Problems, J. W. Heslop Harrison, in Trans. Nat. Hist. Soc. of

Northumb., Durham, and Newcastle-on-Tyne, v., pp. 244-298, tt. 15, 1921. A most suggestive paper, treating on the very difficult problems of Rose classification, genetics, and hybridity. He admits 8 species found in his area—*canina*, *Afzeliana* (which consists of *glauca* and *coriifolia*), *rubiginosa*, *agrestis*, *mollis*, *tomentosa*, *pimpinellifolia*, and *cinnamomea* (no locality for this alien species being given). The paper cannot be condensed in a satisfactory manner, but no student of the Roses can afford to ignore it. A history of the recognised Rose Hybrids is given. He records *R. pimpinellifolia* × *lutetiana* from Horden, Durham, and probably from Cowpen Bewley; *R. pimp.* × *dumetorum*, Durham (t. 11), on the magnesian limestone; *R. pimp.* × *coriifolia*, var. *frutetorum* (t 12) (=*R. hibernica*, var. *laevigata*), and *R. rubiginosa*, var. *comosa*, East Lothian (Barclay); *R. pimp.* × *glauca*, Corbridge, Northumb.; *R. pimp.* × *omissa*, Slaley, Northumb. (t. 13) (it is the *Sabina* of Baker and Tate from this place 60 years ago); *R. pimp.* × *tomentosa*, var. *sylvestris*, Hawthorn Dene, Durham (t. 14); *R. coriifolia*, var. *Lintoni* × *lutetiana*, not localised (Harrison names it × *Rosa promissa*). Plates of *R. pimp.* × *rubiginosa*, *R. eminens* (Durham), *R. pimp.* × *mollis* (Northumb.), *R. pimp.* × *omissa* (Barclay, Auchterarder), and ripe fruits of others are given. The paper should be read in connection with that of Almquist, for although the methods of approach were reversed by Mr Harrison, yet the conclusions arrived at are similar. Each has produced a table which can be used as a kind of Mendeleeff's Periodic Classification to predict the existence of roses as yet undiscovered. The vertical group of the chemist agrees with Harrison's section-species, the horizontal series or periods with his species-types. If the six members of the Caninae be divided into three pairs of more nearly related section-species, there is an immediate parallel to the divergence in Mendeleeff's table into two sub-groups. Almquist, working as a systematist, and Harrison, as a geneticist, arrived at essentially the same conclusions and announced them practically simultaneously.

978. SAXIFRAGA DECIPIENS Ehrh. Recently this name has been dropped in favour of *S. rosacea* Mönch on the ground that *decipiens* was a nomen nudum. Schinz & Thellung show this is not the case:

that *decipiens* in Ehrhart's *Beitrage* v., 47, 1790, had a synonym, *S. petraea* of Roth, cited (*Tent.* v., 1, 184), which makes the name valid, Roth's plant being *decipiens* and not the Linnean *S. petraea*.

1006 (2). TILLAEA AQUATICA L. While looking for plants at Adel, near Leeds, on September 1st, I chanced to come across a new British plant, *Bulliarda aquatica* L. (nat. order: Crassulaceae). It is associated with *Limosella aquatica* and *Polygonum minus*, and it grows in abundance on the drying-up mud. The dry season probably made it more conspicuous than usual and enabled me to find it. It is in all probability native and it grows in untouched private grounds that people seldom visit. The only planted shrubs anywhere near are Rhododendrons, but those are a long distance away. R. W. BUTCHER.



TILLAEA AQUATICA L.

TILLAEA AQUATICA L. *Bulliarda aquatica* DC. in Bull. Soc. Philom. iii., n. 49, p. 1. 1801. *Crassula aquatica*. Sect. *Bulliarda* DC.—Flowers hermaphrodite; calyx 4-partite; corolla 4 petals; carpels 4; capsule many seeded; plant small, 2-5 cm. high; leaves linear, 4 mm. long; flowers shortly stalked or sessile; petals very small, white. *Icones Fl. Danica*, t. 1510. *Exsiccata Schultz* 3927. *Puel et Maille* 40, from Sweden. Distribution inland: Norway, Denmark, Sweden, Finland, Russia, North Germany, Bohemia, Moravia, Austria (rare). First found in Britain by Mr Roger W. Butcher on September 1st, 1921, on the muddy margin of a piece of water in a park near Adel, N.-W. Yorkshire. To this place Mr Butcher conducted me on September 15th. The plant was in considerable quantity, growing with *Limosella*, *Callitriche*, and other native aquatics and mud-species. (See *Nat.* 1920.). The geographical distribution is in favour of its being a native species: it is not a plant at all likely to be introduced, as it has no beauty to commend it, nor has it economic value. It may be held that as it occurs in a place which has been visited by competent botanists such as F. Arnold Lees that it could scarcely have escaped their lynx-eyed observation if it had been long growing there. Against this may be urged that it is a very small species and may have been masked by the *Callitriche*, etc., and it may well be that this dry and hot summer of 1921 not only lowered the level of the lake but also stimulated the growth of *Tillaea*. There is a chance that, like *Hydrilla*, it may have been introduced at no very distant date by natural means—by aquatic birds which frequent the lake. But there seems no real reason to challenge its grade as native. Prof. Ostenfeld tells me that in Denmark it occurred formerly in one spot, but disappeared from it, and was about 15 years ago found in quite another part of the country—north point of Jutland, where it still grows. Mr Butcher must be very warmly congratulated on his discovery, and on running the plant down with Mr C. H. Horrell to this species. I am very grateful to them for submitting a specimen on September 9th, and for their kindness in showing me the plant *in situ*. It is one of the most important additions to our flora of recent years. One may also state that there is a curious and as yet an inadequately-explained phenomenon—that of plant periodicity: the sudden appearance in many places of a rare species, *Cyperus fuscus*, for instance, of which an example is cited on p. 401. *Cerastium pumilum* and *Teucrium Scordium* offer other examples; but there are many others which will occur to field-botanists, so that the non-observance of a plant in a locality is not a proof of its complete absence.

1073. CIRCAEA CANADENSIS Hill Veg. Syst. x., 21, 1765. Fernald (*Rhodora* xix., 85-8, 1917) states that this is the same plant as the European *C. intermedia* Ehrh. Beitr. iv., 42, 1789, and if it is retained as a species may have to bear that name. Its grade is, however, open to question. Some botanists consider it a hybrid, of which we lack experimental proof, and its geographical distribution is somewhat antagonistic. The majority of systematists put it as a variety of *C. alpina*. Fernald's view is opposed to the suggestion that *C. intermedia* is *C. alpina* × *C. lutetiana*, for, as he states, *C. lutetiana* does not occur in N. America.

†1092 (2). BUPLEURUM FONTANESII Gussone Ind. Sem. Bocc., 1825. Alien, Sicilia, Sardinia, Calabria. Ibrox, Glasgow, 1921, R. GRIERSON. Det. at Kew. Closely related to and perhaps only a variety of *B. Odontites* L., into which it is merged by Nyman, and in the Kew Index. Archangeli keeps them distinct.

†1188 (2). LONICERA CAERULEA L. Alien, Europe. On waste ground, Woodhall Spa, Lincoln, 1921, Rev. F. S. ALSTON.

1243 (2). SOLIDAGO CAMBRICA Huds. Fl. Angl. 319, 1762. Much confusion exists as to this plant. As represented in the chief herbaria, it consists of several entirely different forms. I believe the true *S. cambrica* to be a distinct species with a rather limited range of distribution having its centre in the Snowdon range, and in order to define the species I have gone to the original description by Dillenius. Hudson (*l.c.*) describes his plant " foliis lineari-lanceolatis subserratis incanis panicula corymbosa terminali." He cites the synonym " Narrow-leaved Mountain Golden Rod, with a hoary leaf and conglobate flowers, from *Ray Syn.* 177 (first described in the 2nd edition of the *Synopsis* 81, n. 3, 1696). In pascuis ad summitatem montis Glydyr copiose. An vero species distincta sit a vulgari, an potius ejusdem varietas ulteriori examini relinquimus D. Lhwyd?" Dillenius, *l.c.*, 177, rightly queries Plukenet's plant as being this. He says, "An Virga aurea montana, biuncialis, pumila, foliorum apicibus obtusis *Pluk. Alm.* 390, t. 235, f. 8. In hortis culta ad pedalem assurgit altitudinem." In 1778 Hudson (*Fl. Anglica*, ed. 2, 369, 1778) adds the counties of Westmorland and York to the " in pratis montosis in Wallia," and in both editions cites Petiver's " *Virga aurea Cambrica* H.B., t. 16, f. 11." Hudson, however, overlooks the minute and clear description of the plant by Dillenius (*Hort. Eltham.* 413), which is now given in an abbreviated form. It shows what a close and accurate observer Dillenius was. "We owe this species of *Virga aurea* to the unwearied labours of Edward Lhwyd, who first observed it in the pastures of Mount Glyder, leaving to further examination whether it is a distinct species or merely a variety of the common form. Many years have now passed, during which, both in the Eltham Garden and in others, it has remained distinct from the common species. The chief difference is that the numerous flowers are attached only to the top of the stems, where they are closely massed together in a small obtuse spike. It is, besides, shorter in height, with a more slender stem, smaller, narrower, and more hairy leaves. Further, it blossoms earlier than the common species, especially in gardens. Its stems are a span or nine inches in height, growing simply, that is, without branches, from the same root, and even in the garden rarely exceeding the height of one foot. The leaves are slightly rounded at the base, with those on the main stem longer; they are marked by teeth, which on the lower part of the leaf are slightly round, but on the upper part are longer and more pointed; the veins are prominent, and the leaves, especially round the margins, are closely covered with fine hairs. On the leaf-blades this hairiness is hardly visible, but it is not sufficient to warrant the description of the leaves as *incana* (hoary), wherefore Lhwyd rightly termed them *subincana* (sub-hoary), for the leaves approach simple greenness. The stems, on the other hand, are covered with numerous short hairs, chiefly at the base of the leaf-pedicle. Furthermore, the numerous flowers are attached to the top of the stems—shortly pedicelled, sometimes a single flower on one pedicel, sometimes two or three, and more rarely four—and in these flowers it would seem to be a peculiar feature that the extremity of the style is not recurved, but is divided, as it were, into two brightly coloured, nearly straight, connivent segments. The florets seem to have these segments narrower than in the common species. The calyx is cylindrical and formed of narrow scales. In gardens it flowers in July [or earlier]; in its natural habitats not so early. Moreover, in gardens it produces more shoots from a single root and longer leaves than in the places where it grows wild. It has been named 'Mountain Golden Rod, with narrow, almost sub-hoary, hairless leaves.

clustered florets (*Ray. Syn.*, ed. prim., 50, n. 3; ed. 2, 81, n. 3; ed. 3, 177, n. 4. *Hist. Oxf.*, part 3, 125, n. 18.). Petiver named it (*Herb. Brit.*, t. 16, f. 11) *Virga aurea Cambriae*, and gave an illustration of the common species, borrowed from *Epist. Camerarius* 748, which he improperly passed off as the species here described.' " Dillenius goes on to describe another form which he observed " four years ago in August, on a sandy hillock near a marshy flat at Petersfield, which was only two inches to a span high, with pointed as well as obtuse leaves." He thought this was no more than a variety of the common species, and might be referred to Dwarf Mountain Golden Rod, *Virga aurea montana biuncialis pumila*, twice described by Plukenet (p. 390, t. 235, f. 7), once with pointed and again with obtuse leaves (ibid. f. 8) in the *Almagestum*. " In the figure given by Plukenet the crenations of the leaves are omitted, doubtless by the engraver's carelessness, and the flowers, which, as well as the whole plant, appear to be represented in their natural size, are too small for the specimens to be referable to the *Virga aurea omnium minimum* of *Hort. R. Par.*, though Plukenet seeks so to refer them, and Vaillant (*Comm. Acad. R. Scient.* 308, n. 16, 1720) does refer them. It is also to be observed that Tournefort, Hermann, and Vaillant consider the ' Smallest of all Golden Rods with the largest blooms,' described and figured in *Par. Bat.* 245, to be identical with the plant of *Hort. R. Par.* Plukenet does not mention the source from which he had his examples, whether they were growing wild or under cultivation. Even though they were growing wild, it is not possible to identify his flowers with those of the plant of Hermann, reared as it was in a garden. I observe, moreover, in the Sherardian Herbarium (*Phytophylacium*) a dried specimen of Hermann's plant with glabrous leaves, large flowers, seated on oblong pedicels, which fully answers to the figure and description given by Hermann, and is too widely apart from the figures of Plukenet; so that I have good reasons for believing that the plants of Plukenet are only varieties of the common species. I remember also having seen a plant, the same as our Welsh species, sent from the garden at Leyden as Hermann's plant, which is so far from being reconcilable with the figure and description given by Hermann, and also with the dry specimen gathered in Hermann's time in the said garden, that I consider it quite a different plant. There is, moreover, in the Sherardian Herbarium an example of *Virga aurea montana minor* of Barrelier (*Obs.* 1069, *Ic.* 783) and Boccone (*Mus.*, pt. ii., 169, t. 118). It came from Boccone himself, who left his dried plants to William Sherard, and Vaillant, as above quoted, makes this plant identical with the smallest of all *Virgae aureae* of *Hort. R. Par.* and *Par. Bat.* With this opinion I cannot agree, as the examples of that plant (Boccone's) have leaves hairy above, but below are more nearly sub-hoary than our Welsh plant; the flowers also are closely packed together, and borne on far shorter pedicels. I should have considered it a variety of our Welsh plant had not the leaves been broader in the middle and more pointed towards the extremity. A small Golden Rod, *Virga aurea humilis*, different from the common species as mentioned by Sherard (*Ray Syn. App.* 341, 1696), and again *Virga aurea vulgari humilior* (*Ray Syn.* 176, n. 3, 1724), is a plant with many leaves at the base, half-an-inch in breadth and two inches in length, growing on pedicels of two or three inches; they are serrate all round the edge and slightly hairy; the lower leaves on the stem are similar to these, while the upper become much smaller. From the axils of these leaves along the greater portion of the stem flowers issue, three or four together, on short pedicels, arranged in a kind of spike, and these flowers seem rather larger than those of the common species. This description is given from Sherard's specimen which was gathered in Ireland without the mention of a special locality. And be this sufficient for a knowledge of this species, and its distinctive marks." It is quite evident that Dillenius rejects as applicable the synonyms of Petiver and Plukenet which were afterwards added to *cambrica* by Hudson.

Miller (*Gardeners' Dict.*, ed. 1768) has made 5 British species:—(1) S. LATIFOLIA, based on *Virga aurea latifolia serrata* C. B. P. 268. He says it is not common in England, though that which grows naturally near London is generally taken for it. It is plentiful about Brabant, and the most common in Germany. (2) S. VULGARIS = *V. aurea vulgaris* Park. Theatr. 542, is " our common Golden Rod about London." A still-born name, as he cites *Linnaeus* 880 for it. (3) S. ANGUSTIFOLIA = *V. aurea angustifolia minus serrata* C. B. P. 268. In several parts of England. In woods at Dulwich, Surrey. (4) S. MINOR. This is Rand's plant, " the smaller Golden Rod with sawed leaves pointed at both ends." It grows naturally in the woods at Hampstead, and is probably the plant of Gerard 349, 1597. Miller states that it remained quite unchanged in cultivation for many years. (5) S. MINUTA, based on *Ray's Syn.* 177, is Lhwyd's plant (but with an inappropriate and invalid name) from Wales, which Miller states flowers five or six weeks before the other. Miller's description does not quite agree with that of Dillenius. He says the leaves are a little hoary on the under-side. There is already a *S. minuta* L. Sp. Pl. 1235, 1763.

Smith (*Eng. Fl.* iii., 439) reduced all the *Solidagos* of previous British authors, including *S. cambrica*, to varieties of *S. Virgaurea*. Babington, Hooker, and Syme follow the same plan, but it is evident that these authors possessed different ideas as to what *cambrica* was. Smith (*Eng. Fl.* iii., 439) gives Hudson's, Ray's, Dillenius', and Plukenet's synonyms and says:—"Although Hudson and Willdenow (*Sp. Pl.* iii., 2066) considered it a permanent species, he could never determine it to be so," which is not to be wondered at, since these synonyms refer to more than one distinct plant. Babington (*Man.* 169, 1847) says:—" Stem 2-6 in. high, leaves ovate-lanceolate, heads larger," which has no precise significance; Hooker (*Student's Flora* 206, 1884) gives " Short, leaves broader, ciliate, cymes simple, heads larger—usually in mountainous districts," which also is indefinite; and Syme (*Eng. Bot.* v., 113) who, as usual, is more accurate, writes:—" Lower leaves elliptical-obovate; stem-leaves elliptical; all ciliate and slightly pubescent beneath; panicle reduced nearly to a raceme; anthodes large; stem 2-8 in. high," but the figure, t. 779, added to this edition is not very characteristic.

My own experience leads me to consider *S. cambrica* as described above to be distinct from the common and very variable *S. Virgaurea* L., which eventually may be proved to contain several elementary species. In cultivation the points of difference become accentuated. The flowering period is well nigh over before the lowland plant begins blossoming—this is also true of the British Alpine Thrift, *Statice planifolia*—and in both instances it suggests a physiological difference, and is unexpected, as at the first blush the warmer lowland temperature might be expected to hasten flowering. This point awaits investigation. It may well be that the incidence of light-action may be more intensive at higher altitudes, and here there are biochemical problems which await solution. In addition to this difference of the flowering-time, the simple stem, with the flowers arranged in a loose spike-like inflorescence, starting from above the middle of the stem; the larger and stouter capitula; the narrower, elliptic, glabrescent leaves, which are ciliate on the margin, are the characters which help to differentiate it and which cultivation rather intensifies. These differences, in the main, were observed by Dillenius, who had the plant from Lhwyd and cultivated it for many years in James Sherard's garden at Eltham (the *Hortus Elthamensis* dates from 1732; Lhwyd found it before 1696). Our member, Mr J. Griffith, has had it for many years in his garden at Bangor, and he is in full accord with me in considering it distinct, an opinion strengthened by observations on it made in my own garden at Oxford, where it grew side by side with the common plant. A curious fact is that both Mr Griffith and myself failed to obtain seedlings.

Lhwyd's plant is neither common nor widely spread. I have it from the Glydyr, Snowdon, Carnedd Llewellyn, the Berwyn, and I think to it must go Don's *S. lapponica* gathered on Loch-na-gar in the eighteenth century. In herbaria it is mostly represented by montane forms of *S. Virgaurea*, the indefinite description and wrong synonyms since the time of Petiver contributing to this error. Therefore I suggest the restoration to specific or sub-specific rank of Hudson's *S. cambrica*, with the deletion of the erroneous synonyms cited by Hudson from Petiver (whose plant seems to be a small *Virgaurea*), and of Plukenet's obtuse-leaved plant, which is a more widely diffused montane var. of *S. Virgaurea*, and to designate the latter as S. VIRGAUREA L., var. PLUKENETIANA. This has the capitula nearly as large as those of *cambrica*; the leaves small, feebly toothed, obtuse; plant small, 2-8 in. Usually montane, but also occurring on the coast in Cornwall and on the Stack Rocks, Anglesey, ascending to nearly three thousand feet on An Teallach, W. Ross. Also on Ben Eay in that county; on the Cuchullins, Skye; Glen Aan, Banff; Hoo Field, Shetland; and near High Force, Durham. Under this and merging sometimes into it is nov. sub-var. *acutifolia*, a plant with the upper or all the leaves acute, which is a common mountain plant—Ravine of the Eala Water, Shetland; Ronas Voe, Shetland (Tate's *cambrica*); Fannich, W. Ross; Cuchullins, Skye; Ballater, S. Aberdeen; rocks by the Wye, Brecon and Radnor (Ley), as *cambrica*; Llanwrtyd Wells, Brecon (Painter), as *cambrica*.

Another variety of the small-flowered type is var. CORYMBOSA Druce, which occurs on the cliffs of Lunan Bay, Forfar, and at the Lizard, Cornwall, in which the flowers are clustered into a cormybose cyme, about 2 in. by 2 in., the leaves being more or less crenate.

Var. ANGUSTIFOLIA Gaudin Fl. Helv. v., 316, foliis angustioribus obscurius serratis = *V. aurea angustifolia* C. B. P. 79. This has "flores pauciores laxioresque." Gaudin gives Monte Muteto as its habitat. Miller (*Gard. Dict.*, 1768) calls it Woundwort, with linear, spear-shaped leaves almost entire, with flowers in clusters sitting close at the wings of the stalk. He goes on to say of the Dulwich plant that "the leaves are about $1\frac{1}{4}$ in. long by an eighth of an inch broad; they are almost entire and sit close to the stalk." I have never seen plants in Britain answering Miller's description; indeed, in *Index Kewensis*, I know not on whose authority, it is identified with *Senecio sarracenicus*, but that plant is not recorded by Brewer in his Surrey Flora, nor does Dulwich Wood seem a likely place. Neither Bouvier nor Gremli refer to var. *angustifolia* in the Swiss Floras, but Koch (*Syn. Fl. Germ.* 355, 1837) says:—"Elatior, foliis omnibus lanceolatis obscurius serratis vel integerrimis." A specimen I gathered at Lynmouth, N. Devon, 1896, comes under Koch's description. I have a plant with lanceolate leaves from the River Broom side, West Ross, but the flowers are pedicelled and mostly at the top of the stem—not in axillary clusters: this may be distinguished as var. LANCEOLATA nov. var. To this may be put Gardner's plant from Ericht, above Blairgowrie, Perth; Waterfall's plant from ravine near Carrickmore, Co. Dublin; Piquet's St Brelade's Bay plant, and also my Hampstead Heath specimen.

Taking Miller's or Koch's characters, we find that they rarely apply; that is, plants with a corymbose inflorescence may have broader or narrower leaves, the leaves may gradually diminish in size from the base to the summit of the stalk, or they may abruptly change from broad to narrow. Again, axillary-inflorescensed plants may have narrow or broad leaves, and plants with large capitula may show the same cross-characters. An intensive study of the plants under culture is to be strongly urged. Probably in a *Hieracium* sense there are five or six "species" grouped under *Virgaurea*. Even now I am rather doubtful whether it would not be better to put var. *Plukenetiana* under *cambrica* than under the type, as it has the same large capitula. For the time, however, I suggest the arrangement—

S. VIRGAUREA L. (grex).
  Var. *angustifolia* Gaud.
  Var. *lanceolata* mihi.
  Var. *corymbosa* Druce.
  Var. *Plukenetiana* mihi.
    Sub-var. *acutifolia* mihi.
S. CAMBRICA Huds.

1262. ERIGERON CANADENSIS and BONARIENSE. J. Burtt-Davy, writing on "New or Noteworthy South African Plants" in *Kew Bulletin* 7, 282, 1921, alludes to these two species, which have been much confused, and he refers to the misleading figures of *canadensis* in Bentham's *British Flora*, and in Britton & Brown's *Flora of the Northern United States and Canada*. *Linifolius* is supposed to be of eastern origin, though now common in South Africa, and it is the *E. bonariense* of some authors. Both occur on Tweedside and are included in the *Adventitious Flora*, where a photograph of the pappus of *bonariense* (*linifolius*) is given. Mr Burtt-Davy gives the following definitions of the species :—*E. bonariense*, for which the name *linifolius* is used—Branches long, corymbose, often much exceeding the main stem, and flowering after the heads, which terminate the latter, have shed their fruit ; heads larger than in *canadensis*, fully 3 lines long ; leaves grey-green, not ciliate, the lower distantly and incisely toothed or laciniate ; involucre pubescent. *E. canadensis*—Branches short (not corymbose), flowering at the same time as the main stem ; heads only 1½-2 lines high ; leaves yellowish-green (not grey-green), the lower sparingly toothed to quite entire, ciliate, with short, mostly incurved hairs arising from small tubercles ; involucre almost glabrous ; pappus usually tawny (in *bonariense* white or reddish in herbarium specimens).

†*Gen.* 297 (5). HELIOPSIS Pers. Syn. ii., 473, 1807.

†1295 (15). H. SCABRA Dunal in Mém. Mus. Par. v., 54, t. 4, 1819. Alien, Amer. bor. Hortal. Glasgow, 1921, R. GRIERSON.

†1302. HELIANTHUS DIFFUSUS Sims Bot. Mag. xlv., t. 2020, 1818, according to Schinz & Thellung (*l.c.*, 307) takes precedence of *H.*

rigidus Desf. Cat. Hort. Par., ed. 3, 184, 1829, and *H. scaberrimus* Elliott Bot. Sketch 423, 1824, not of Bentham of 1844. It is the *Harpalium rigidum* Cass. in Dict. Sc. Nat. xxv., 300, 1821.

†1307 (2). VERBESINA ENCELIOIDES Benth. & Hook., ex A. Gray in Bot. Calif. i., 350. *Ximenes Encelioides* Cav. Ic. ii., 60, t. 178, 1793. Alien, North, West, and South America. Hortal. St Peter's Marsh, Bristol, 1916, Miss COBBE.

1360. MATRICARIA INODORA. The maritime forms of this species are described in *Journ. Bot.* 170. 1921, by L. V. Lester-Garland. Three varieties are given:—(1) *maritima* L., (2) *salina* DC., (3) *phaeocephala* Rup. This latter is one of the noticeable plants of the Shetlands, and is remarkably fine. A specimen nearly three feet high was seen at Haroldswick which had over a hundred flowers, each between two and three inches in diameter.

1360. M. INODORA L. Schinz & Thellung (*l.c.*, 304) agree with Briquet and Cavillier that if, as generally assumed by recent writers of Floras, *M. maritima* and *M. inodora* are to be united, the trivial name *maritima* must be used as being the older, in accordance with Internat. Rule 9, Art. 46, contrary to the general procedure, even when the species is put into the genus *Chrysanthemum*. The inland plant is *Matricaria maritimum* L., var. *agrestis* Weiss in Hall. und Wohlf. in Koch Syn. 1424, 1895. Probably this may strike some botanists as ridiculous, since the commoner plant is not maritime, and the name may for that reason remain unchanged.

1362. M. DISCOIDEA Pursh in Britain. Druce in Gard. Chron. 186, 1921. First evidence: a plant gathered at Kew in 1871 by Mr J. Gilbert Baker in *Herb. Druce*, labelled by Baker *M. Chamomilla*, var. *discoidea*.

†1363 (3). M. TCHIHATCHEWI (Boiss. in Tchihat. Asie Min. Bot. ii., 256), as *Chamaemelum*. Alien, Asia Minor. Hortal. On a sandy common near Byfleet, Surrey, May 1921, Lady DAVY: named by W. B. TURRILL. See *Boiss. Fl. Or.* iii., 332. It grows near *Arabis glabra* and *Ulex*, but is probably of garden origin.

1456. CENTAUREA SCABIOSA L., forma HETEROPHYLLA Beck Fl.

Nied.-Osterr. ii., 1260, 1890. Yarnton, Oxford, 1913, DRUCE; determined as above by C. E. BRITTON, who says it is described by Beck as having the lower leaves undivided, elliptical, tapering into the petiole, acute, irregularly serrate-dentate, or even somewhat lobed; upper leaves pectinate-pinnatipartite. Similar plants grow in Surrey.

1456. C. SCABIOSA L., nova forma INCISA C. E. Britton. Gravel pit near Grays, Essex; Crantock, Cornwall, A. LOYDELL in *Herb. Druce.* Leaves pinnatisect, rachis very narrowly winged, hirsute, segments spaced, oblong or elliptical, acute, narrowed at base, lobate-serrate, pubescent above, thinly hirsute beneath. A very pretty plant. The Crantock plant has less-incised leaf-segments. C. E. BRITTON.

†1512 (2). HIERACIUM BRUNNEO-CROCEUM Pugsley in Journ. Bot. 67, 1921. Allied to and confused with the Linnean *aurantiacum*; the latter occurs in many Scottish situations, and at Berwick-on-Tweed, Yorkshire, Middlesex, and Isle of Wight. Mr Pugsley's plant differs by its narrow, oblong-lanceolate leaves and in its rather small heads of a brownish-orange colour—hence the name. He identifies plants of it from Selly Oak, Worcester; Bellgrave, Leicester; Great Tew, Oxford; Glynhir, Carmarthen; Culbone, Somerset; Trentishoe and Barnstable, North Devon; Newlyn East, West Cornwall. To these may be added—Near Coventry, Warwick; Bradfield, Berks; Mangan, Cornwall; Bourn Hill, Middlesex (LOYDELL); Patshull, Staffs (Lady JOAN LEGGE); Baildon, York (CRYER); Formby Sands, S. Lancs (WHELDON); Kyle of Lochalsh, W. Ross (DRUCE).

1537. H. AMPLEXICAULE L. A note on its occurrence not only at Oxford but on a bridge crossing the Mersey, Cheshire and Lancashire (see *Rep. B.E.C.* 553, 1897), is given by Mr J. C. Melvill in *Journ. Bot.* 48, 1921. Although once nearly eradicated from Magdalen College, Mr Gambier-Parry informs me it has now spread in a remarkable manner on the roof. One may add that a similar plant was sent to the Botanical Exchange Club (see *Rep. B.E.C.* 827, 1919) labelled *H. vulgatum*, var. *amplifolium*, from the Mersey locality. "*H. amplexicaule*" was also sent to the Club (*Rep. B.E.C.* 553, 1897) from a field wall near the viaduct, Saltburn, N.-E. York, by Charles Bailey. "Garrie Barns, Clun," is cited by Mr Melvill for Don's station. It should be Garrie Barns, Clova, Forfar, but the plant which grew there was wrongly identified as *amplexicaule*. It was *H. anglicum*, var. *amplexicaule* Bab., a native plant. Of the above the Oxford plant is true *amplexicaule*. The other plants need to be re-examined in view of the recently recorded *H. pulmonarium* by H. W. Pugsley.

1630. H. RIGIDUM Fr. Some Experiments on the Origin of New Forms in the Genus *Hieracium*, sub-genus *Archieracium*, by C. H. Ostenfeld, in *Journ. Genetics* xi., 117, 1921. In one of the experiments seeds were sown from *H. rigidum* Fr., originally from Svendborg, Denmark. Of 154 resulting plants, 153 were normal but one was different in several respects. Some flower-heads of this individual were agamized in 1911 and seed sown in 1912. The new generation flowered in 1913. All plants of this generation were uniform and like their parent. This experiment has been repeated twice. The new form he calls *H. rigidum β*. The distinguishing features are given. Other experiments resulted in obtaining a constant third form—*H. rigidum γ*. He calls them apogamic mutants and thinks that the numerous micro-species of *Archieracium* found in nature have arisen apogamically and are constant. Figures of the three forms are given.

1644. LEONTODON NUDICAULIS Banks. With reference to the much-discussed nomenclature of *Thrincia hirta*, Lacaita has come to the conclusion that—(1) *Crepis nudicaulis* L. corresponds either to *Leontodon Villarsii* Loisel. or to *L. crispus* Vill., or to a mixture of the two species; (2) *L. hirtus* L. is not identical with *Thrincia hirta* Roth, but with *L. Villarsii* Loisel., and should therefore replace the latter species; (3) the correct name for *Thrincia hirta* is *Thr. taraxacoides*; &c. Schinz & Thellung adhere to their statements in *Bull. Herb. Boiss.*, 1907, which Lacaita seems not to have read. The only new point is the definite observation by Lacaita on the specimens in *Linn. Herb.* that *Leontodon hirtus* L. (1759) corresponds to *L. Villarsii* Loisel., as we had already suggested to be possible on literary grounds, and that in 1763 *Thrincia hirta*, in the form of the synonym *Crepis nudicaulis*, came in as an additional constituent. As against Lacaita they point out—that

Crepis nudicaulis, which is not in *Herb. Linn.*, is clearly founded only on Bauhin's synonym, which is rather confused, and of which the only positive basis is the figure in C. Bauhin *Prod.*, for there is no specimen in *Herb. Bauhin.* In this figure we can only recognise *Thrincia hirta*. *L. Villarsii* is excluded by the relatively short stem of the plant figured and the incision of the leaves; and also *L. crispus* (to which the figure belongs, according to Lacaita) by the incision of the leaves, by the almost uniseriate involucre, and by the short pappus. Still, it would appear that the simple hairs given in the figure (and "setis subalatis" in the description of *Cr. nudicaulis*) tend to oppose our view. But the same difficulty arises in Lacaita's proposed identification of Bauhin's plant with *L. crispus*, for, as is well known, *Thr. hirta* (in contrast to *L. Villarsii*) has branched furcate hairs. Lacaita's suggestion that the distribution of *Cr. nudicaulis* given by Linné (after Bauhin) holds for *L. crispus* and *L. Villarsii*, but hardly for *Thr. hirta*, is quite untenable, for *Thr. hirta* is by far the most common of these species of *Leontodon* about Montpellier, as we have already pointed out. We would urge our botanical colleagues, therefore, to abide by the name *Leontodon nudicaulis* (L.) Banks em. Porter, for *Thr. hirta*. As regards the comb. nov. *Leontodon taraxacoides* suggested by Lacaita, it must be remarked that, apart from the name created by Mérat in 1831 (of the invalidity of which, as urged by Lacaita, we are not convinced), this combination was formed by Ascherson & Graebner in the sense adopted by Lacaita. Moreover, for those botanists who, like ourselves, do not regard *Thr. hirta* and *Thr. hispida* Roth as distinct species, the combination *Thr. taraxacoides* (Lacaita, *l.c.*) would not be new, but the form *Thr. taraxacoides* Gaudin (1829) sens. ampl. (incl. *Thr. taraxacoides* Lacaita) would have to be used. See Schinz & Thellung, *l.c.*, 308.

1645. TARAXACUM LAETUM Dahlst. Om Skandinav. Taraxacum—förmer in Bot. Notiser 1905. Sweden, Norway, Finland, Denmark and Russia. St Ouen's, Jersey, April 1920, G. C. DRUCE. This belongs to the Erythrosperma, and is a small plant with strongly recurved leaf-lobes.

1645. T. CHLOROLEUCUM Dahlst. Nya Ostsvenska Taraxaca. Ark. för botanik, band 10, n. 6, 1911. Sweden, Norway, Denmark, Finland. Longworth, Berks [Ref. No. X 23], not typical, but as a form. Another modification was gathered by C. E. BRITTON [Ref. No. 1556] on Barnes Common, Surrey, May 1916. One of the Vulgaria group.

1645. T. COPIDOPHYLLUM Dahlst. Ostsvenska Taraxaca, Ark. för botanik, band 9, n. 10. Sweden, Norway. Beckley, Oxford, as an allied form, 1920, G. C. DRUCE.

1645. T. GELERTI Rankiaer Dansk Exkurs. Flora, 2 Udg., 1906. Sweden, Norway, Finland. This (as a var. or a new allied species) is the Ref. No. O 44 from Oxford (cult. since 1907), G. C. DRUCE. Another allied form was found at Gt. Burgh, Surrey, May 1911, W. A. TODD.

1645. T. LONGISQUAMEUM Lindb. f. in Acta Soc. pro Fauna et Flora Fennica 29, no. 9, 1907. Scandinavia. Beckley, Oxon [Ref. No. X 17], June 1920, as a modification, G. C. DRUCE.

1645. T. POLYODON Dahlst. Ostsvenska Taraxaca, Ark. för botanik, band 9, n. 10, 1910. Sweden, Finland, Russia. A plant, very nearly allied to the above, grew at Oxford [Ref. No. X 25], G. C. DRUCE.

1645. T. BRACTEATUM Dahlst. Oxford, May 1908; Wytham, Berks, G. C. DRUCE; Barnes [Ref. No. 358], Wimbledon, Surrey [Ref. Nos. 377, 378], W. A. TODD.

1645. T. LINGULATUM Dahlst., nova species. Oxford [Ref. No. Y 52], May 1920, G. C. DRUCE.

1645. T. UNGUILOBUM Dahlst. Nordsvenska Taraxaca in Ark. för botanik, band 12, n. 2, 57, 1912. Norway. On gravel, Oxford [Ref. No. Y 99] (cult. since 1914), G. C. DRUCE. Also from damp natural pasture, Isgarth, Sandey, Orkney, May 1920 [Ref. No. 651], H. HALCRO JOHNSTON. Dahlstedt places it with the Spectabilia.

(*The exigencies of space do not allow the lengthy descriptions of these critical* Taraxaca *to be given in this* Report.)

1663. TRAGOPOGON PRATENSE L. The Flowers and their Opening and Shutting. Miller Christy in *Journ. Bot.* 253, 1921.

1666. JASIONE MONTANA L. British forms of this are described by H. W. Pugsley in *Journ. Bot.* 209, 1921. Forma nova LAEVIS. Hounslow, TRIMEN. Var. MAJOR Mert. & Koch. Woburn Sands, Beds, and Sale, Cheshire. Mr Pugsley rejects the name *major*, which has until recently been given in Britain for the robust coast plant, to which he gives the name var. *latifolia*. It occurs on the coast from Cornwall to North Unst, and in several stations in Ireland. It is remarkably showy at Burrafirth. Var. LITTORALIS Fries. Around Bournemouth, and doubtless elsewhere.

1725. PRIMULA VULGARIS Huds. The Pollination of *P. vulgaris*, by A. A. Dallman, in *Journ. Bot.* 316-337, 1921. A very painstaking investigation. Occasional self-pollination is indicated. In St Kilda it fruits where bees and Lepidoptera are absent, but it may be due to Diptera. I found it fruiting in the Isle of Mousa, Shetland, in 1921.

1726. P. VERIS L. The darker-flowered form, recently alluded to in *Gard. Chron.*, has also been sent this year from Melmerby, Cumberland, by the Rev. W. WRIGHT MASON. It seems to be a colour-variant or mutant.

1727. P. FARINOSA L., The variation of, in Co. Durham. J. W. Heslop-Harrison, D.Sc., in *The Vasculum*, February 1921, states that *P. farinosa*, from the mountain limestone and basalt of Upper Teesdale and Upper Tynedale, and that found on the magnesian limestone of the Durham Coast are racially distinct. He therefore separates the coast plant as var. *littoralis*, differing in the shape of the flowers : in the var., segments more rounded (as in *P. sinensis*) ; in the type, more stellate (as in *P. sinensis*, var. *stellata*). Plants of *littoralis* are smaller and more generally form a spreading rosette. At the flowering period the coast plant has clear, bright green leaves, the type has darkish, greyer-green. *Littoralis* leaves are broader, shorter, and even fleshier, on the under surface more farinose, and in many cases entire, as contrasted with the longer and more denticulate leaves of the type. The type flowers a fortnight before *littoralis*—another instance of the earlier flowering of mountain over the allied lowland plants. The type flowers average 11.4 mm. against 10.2 in *littoralis*. The seeds of *littoralis* sown in November commenced to grow in early spring; those of the type similarly sown did not do so till a year later. The mountain plant shows a greater range of variation—in colour, in the size of the yellow bird's eye, in doubling, and in fimbriation. *Littoralis* has its affinities with *scotica*; it is much less variable than the type. Dr Harrison contends that all the much-prized forms of variation, worked for with so much zeal and experiment in *P. sinensis*, *obconica*, and *malacoides*, exist in *P. farinosa* in nature. Consequently, the assigning of the appearance of fimbriation in *obconica* to hybridisation with *sinensis* and so on is uncalled for.

†1712 (3). ANAGALLIS MONELLI L. Sp. Pl. 1753 = A. LINIFOLIA L. Sp. Pl. 1762. Alien, S. Europe. Hortal. Waste ground, Oxford, 1921, Lady DOUIE.

1831. VOLVULUS SEPIUM Junger, var. (vel lusus) SCHIZOFLORUS mihi. *Calystegia sepium* Br., var. *schizoflora*. Corolla deeply divided—to below the middle—into five rather narrow lobes. Found by Miss TODD at Ashburton, Devon, in 1921. An analogous form to the var. *Stonestreetii* of *C. arvensis*. G. C. DRUCE.

1845. SOLANUM DULCAMARA L. Cadwell, Beds, 1921. A cow died of eating the plant. The same occurred in 1907 at Offley, near Hitchin. A farmer tells me that the most dangerous time is up to about June, and that cases are frequent. J. E. LITTLE. In the nineties a valuable flock of sheep, then in a state of parturition, were for the most part destroyed by eating *Dulcamara*, which grew in a nearly dried-up ditch bordering the field, and of which they had been freely feeding. An analytical examination showed that they were poisoned by an alkaloid (? solanine). G. C. DRUCE.

†1846. S. NIGRUM L., var. ATRIPLICIFOLIUM (Desp. Fl. Sarthe 189, 1838, as a species) Dunal in DC. Prod. xiii., pars i., 50. This name antedates the var. *sinuata* described in *Rep. B.E.C.* 33, 1920. The plant is contained in the *Flora Italica Exsiccata* 2516, from Lido, near Venice, and Beguinot says it grows promiscuously with the type but keeps perfectly distinct. That, too, is my impression so far as I have seen it on rubbish-heaps in Britain.

1894. SCROPHULARIA NODOSA L., forma (vel lusus) TERNATA

Druce. Miss HILLARD sent from Hayling Island, S. Hants, in 1921, a specimen of *nodosa* with three leaves in a whorl. It had been found also by her in a previous year. It is analogous to the so-called var. *verticillatum* of *Epilobium montanum* and Williams' var. *ternata* of *Anagallis arvensis*. G. C. DRUCE.

†1898. MIMULUS GUTTATUS DC., var. YOUNGANA (Hook. in Bot. Mag., vol. 61, t. 3363) as a var. of *M. luteus* = *M. rivularis*, forma *Youngana*. This is the beautiful *Mimulus* from Glen, Peeblesshire. See my note in *Rep. B.E.C.* 571, 1919.

1911. VERONICA BECCABUNGA L., var. REPENS Bosch Prod. Fl. Batavoe 1, 1850. This is a state rather than a true variety. It is often an autumnal form growing on the partly-dried mud of brook and pond margins. I have distributed it this year. It was first mentioned for Britain in *Rep. B.E.C.* 381, 1892, having been found by J. A. Griffith near Carnarvon in 1872. It is alluded to but not named in *Flor. Batav.*, vol. v., under t. 476, 1832.

†1923. V. TOURNEFORTII Gmel. Lacaita, as previously Williams, rejects this name, because the species is a heterogenous mixture and therefore illegal according to Art. 51-4. Schinz & Thellung (*l.c.*, 301) state that in their opinion there is no sufficient reason for rejecting the oldest name for the species in question, even if the synonyms noted by Gmelin refer to *filiformis* Sm. Still, the actual concrete plant in the authors' mind was undoubtedly, from its locality (Karlsruhe), *V. Tournefortii* auct. Moreover, Buxbaum's two figures of *V. Tournefortii* and *V. filiformis* are so similar that only a specialist could distinguish them. Any ordinary person would, as Gmelin did, mistake the one for the other. If all names with attached false synonyms are to be rejected, then at least half of the names given by Linnaeus and generally accepted would have to go. Therefore, *V. Tournefortii* Gmel. may be safely used to designate our British cornfield plant.

1934 (4). EUPHRASIA SEPTENTRIONALIS Druce & Lumb, nov. sp. Near Duncansby Head, Caithness, in turf, 2-300 ft., July 1920, G. C. DRUCE. Plant stout, shaggy-looking, sage-green, long-bracted, small-flowered, glandular. Stem—Thick, 3-8 cm. high,

fairly strict, sometimes simple, often with two opposite branches, sometimes from near the base, sometimes at the middle, sometimes above the middle, sometimes branched throughout, the branches sometimes themselves branched, and the lowest of them nearly as long as the main stem; densely clothed; hairs glandular, straight, sub-equal, comparatively few, consisting almost always of two elongated cells and the gland. Spike—Broad, with short internodes; flowering or fruiting nodes usually few, sometimes as many as 7; flowers slightly projecting from the general outline. Leaves—Lower ovate, obtuse, with few rather obtuse teeth; terminal lobe broader than long; upper ovate, somewhat obtuse, with 3-4 large sub-acute ± acuminate teeth; strongly plicate-striate on the underside; well beset with long hairs, some of which are straight, sub-equal, and glandular, the glandular ones having two elongated cells; not early caducous. Bracts—Sub-decussate, spreading, sometimes markedly deflexed, strongly rugose beneath, broadly ovate, sometimes long-ovate, broad-based, sub-acute, up to 10 mm. by 7 mm.; teeth on each side 5-6, sub-acute; terminal lobe longer than broad; sometimes the teeth of the upper bracts are narrow and acute but not aristate; clothing as of the leaves. Calyx—Teeth broad, sub-acute, with many straight, sub-equal glandular hairs; markedly shorter than its subtending bract; not accrescent in fruit. Corolla—Small, 5-7 mm. long, whitish; tube not elongating; style not protruding. Capsule—Sub-truncate, usually equalling calyx. *E. septentrionalis* differs from *E. hirtella* in its height, in its having few glandular hairs on the stem, in its branching, in its internodes, in its bracts, and in the character of its glandular hairs. From *Rostkoviana* it differs in its having few glandular hairs on the stem, in the character of these hairs, in its rugosity, in the quantity of glandular clothing, and in the size of the flowers. From *E. latifolia* it differs in its lacking the gradually narrowing untoothed bases of the bracts, in the terminal lobe of its bracts, and in its having glandular calyx teeth; in *latifolia* glandular hairs on the calyx teeth are very rare. As we were unable to match these plants among our named forms they were submitted to Dr E. Jorgensen, the well-known Norwegian expert, who says they are a new species with affinities to *E. hirtella*. *E. septentrionalis* was not observed in the Orkneys or Shetlands. It may be that the plant referred to by Williams (*Prod.* 303), gathered by Marshall at Reay, Caithness, and seen there by Druce, may belong here. At Duncansby *E. nemorosa* and *E. brevipila* were in the vicinity. In answer to a question to Dr Jorgensen as to the influence of the host-plant in causing variation in *Euphrasia*, he writes in March 1921, that he "did think it was of little importance, on account of the report on cultivation experiments (*Pringsheims Jahrb.*, vol. 31, 1898). Later on I have had only negative results when I tried to raise *Euphrasia* from seed; neither I nor a botanical friend in another part of the country got a single plant developed. Perhaps this is due to an influence of the host-plants, which in my experiments were species of Gramineae (from seeds). *Euphrasia scotica* seems to me to be closely connected with sphagnum. It would therefore be very interesting to try if plants of that species from sphagnum bogs can be raised on a substratum of sphagnum." A beautiful variety of *E. borealis* from Unst awaits description. G. C. Druce and D. Lumb.

1952. Rhinanthus Crista-galli L. = R. minor Ehrh., var. robustus mihi. Filby, Norfolk, 1905, Druce. Wareham, Dorset, Druce and Mrs Sandwith. A tall, robust plant, nearly two feet high, with broad leaves and capsules nearly 2 cm. diameter. It has much of the facies of *R. major* Ehrh. The flowers are, however, near *Crista-galli*. To this var. belongs, I think, Mr Marshall's var. *platypterus*, from Edington Junction, Somerset. G. C. Druce.

1975. Utricularia. Some valuable Notes on the Genus and its Distribution in Norfolk are given by Mr W. G. Clarke and Mr R. Gurney (*Norf. and Norw. Nat. Hist. Soc.* xi., pt. 2, 128-161, 1920-1). The authors question the value of the specific characters derived from the presence or absence of bladders with the green assimilating leaves. They state that five specimens of *intermedia* had each one sporadic bladder: indeed, examination of some hundreds of specimens on Upgate Common showed that about 5 per cent. had sporadic bladders, while *U. ochroleuca* may possess none. Greater value is placed on the character derived from the attenuated leaf-tip of *ochroleuca* ending in a fine spine, "yet abnormal specimens of *ochroleuca* differ but little from abnormal specimens of *intermedia* in this respect," and "forms on the border-line between the two species must inevitably occur." The authors state that the only known British specimen of the flower of *intermedia* was found on Roydon Common in 1910, but Linton found it flowering in plenty at Morden Decoy, Dorset, in 1893, and I have also seen it in flower in Dorset and Galway. The bladder-contents have been ably investigated, and there are five good plates. One gathers that true *ochroleuca* has not been ascertained to grow in Norfolk except at Foulden Common (named by Mr Bennett), but the Foulden specimens gathered there previously were named *intermedia* by Dr Gluck, as he most likely would those of the later gathering. The literature consulted by the authors, although lengthy, is not exhaustive, since there is no allusion there to Dr Gluck's lengthy paper in *Rep. B.E.C.* 511, 1910, three years prior to the one quoted from another journal, nor to other notes which have from time to time appeared in these pages.

1979. PINGUICULA GRANDIFLORA × VULGARIS mihi = × P. SCULLYI mihi. By the River Roughty, near Drohidnagower, Co. Kerry, September 1921. A beautiful intermediate of the two species, with infertile capsules. I had previously observed similar plants in the south-west of Ireland, as mentioned by Mr Scully on p. 223 in the *Flora of Kerry*, and such have also been noticed by Mr Scully and Messrs Marshall and Shoolbred. The flowers in the Kerry examples are about 15 mm. in diameter; the spur is usually entire, and in some cases shorter than in *grandiflora*; the calyx lobes obtuse, and the corolla scarcely so strongly veined nor the lobes so wide. The Kerry specimens gathered this year are much nearer *grandiflora*.

2056. STACHYS SYLVATICA L., var. IMMACULATA E. M. Cutting in Journ. Bot. 110, 1921. Chiefly differs from the type in the almost complete absence of the purplish streaks on the lower lip of the corolla, the whole plant being of a paler green. Shoreham, Kent, with the type. Is it a chlorotic condition?

2091. PLANTAGO MARITIMA L., var. PUBESCENS mihi. This differs from var. *lanosa* in the base of the leaves not being covered with white silvery hairs, by its being a larger plant (20 cm.), and by the leaves being covered with a short, dull-coloured pubescence. Ordale, Balta Sound, Shetland, 1920. DRUCE.

2092. P. LANCEOLATA L., var. ANTHOVIRIDE [sic] W. Watson in

Journ. Bot. 355, 1920. Thus, provisionally, Mr Watson has named a plant which is frequent in the Taunton district. It differs from the type in a slightly later flowering and greenish-yellow, longly elliptical stamens, which in the type are whitish and oblong-spheroidal.

2100 (4). P. PATAGONICA Jacq. Alien, Amer. bor. et austr. In a grass plot, Woking, Surrey, W. BIDDISCOMBE.

2104. HERNIARIA CILIATA Bab., var. ANGUSTIFOLIA Pugsley. In *Journ. Bot.* 180, 1921, Mr Pugsley, and assuredly correctly, claims precedence for his name over that given for the same plant in the *Cambridge Flora*.

†2123. CHENOPODIUM OPULIFOLIUM Schrad., var. MUCRONULATUM G. Beck. This is Mr Robinson's No. 419 from Watton, Norfolk, which he sent to the Botanical Exchange Club in 1918 as *C. opulifolium* × *album*, when I remarked that I could see no evidence of hybridity. Also sent from Bristol in 1921 by Mrs SANDWITH.

Var. OBTUSATUM Murr. Degenham, Essex, 1921, L. B. HALL.

2124. C. ALBUM L., by Dr J. MURR.

I. Plant mealy and therefore grey-green, glomerules large.

A. Leaves ovate to rhomboid, coarsely toothed .... Grex ALBUM (L.)

1. Leaves elongate with almost parallel margins, distantly and slopingly toothed, very much like those of *Ch. ficifolium*, but larger, more rigid, and more sharply toothed .... sub-sp. *subficifolium* J. Murr.

2. Leaves not elongate.

(a.) Inflorescence with finer branches, smaller glomerules. Leaves of only moderate size, irregularly biserrate, vaguely 3-lobed, thin almost like paper, grey-green or dark green (var. *pseudo-murale* J. Murr); a northern sub-species ...... sub-sp. *pseudo-opulifolium* J. B. Schulz (*suecicum* J. Murr).

(b.) Inflorescence pyramidal, spicate.

(*a.*) Leaves obtuse, biserrate-lobed, strongly mealy. Rare, in dry, sunny places of elevated habitats .... sub-sp. *borbasiiforme* J. Murr in the 50 Jahresbericht of the Mus.-Verein Bregenz, 1914.

(*b.*) Leaves obtuse or acute, irregularly coarsely serrate, more (var. *candicans* Lam.) or less mealy... sub-sp. *album* (L.).

B. Leaves elongate-lanceolate to ovate-lanceolate, entire, definitely green, but not bright green.

1. Inflorescence pyramidal, spicate Grex LANCEOLATUM (Muehlenberg).

(a.) Plant robust, leaves lanceolate, dark green .... sub-sp. *lanceolatum* Muehlenberg (1).

(b.) Plant slender and more delicate; leaves smaller, bright grey-green, the upper sharply mucronate. Derived perhaps from East Asia sub-sp. *lanceolatiforme* J. Murr in Ascherson Festschrift (1904), p. 225.

2. Inflorescence racemose-umbellate (gleichgipfelich) Grex VIRIDE (L.).

(a.) Leaves rather long-stalked, somewhat obtuse, dark green, inflorescences crowded. Rare, more common in the South .... sub-sp. *pedunculare* Bert.

(b.) Leaves shortly petiolate.

(*a*.) Leaves shorter, in part almost rhomboid, with isolated very coarse teeth. Inflorescence only incompletely corymbose .... sub-sp. *paucidens* J. Murr (2).

(*b*.) Leaves entire, lanceolate to ovate-lanceolate.

a. Leaves and entire plant succulent, rather deep green; glomerules large or very large; especially on loose, cultivated soil .... sub-sp. *viride* (L.).

b. Plant more delicate, much branched; leaves narrower, more grey-green; inflorescence very loose, racemose-umbellate, with small glomerules .... sub-sp. *glomerulosum* Rchb. (3).

II\. Plant more or less approaching the *Ch. striatum* (Kras.) J. Murr. Leaves green to bright green; stem markedly striped with red; glomerules smaller [than in I.] or quite small, more or less olive-green ... Grex EUCHLORUM J. Murr, 1921, *in litt.* ad Aellen

A\. Leaves acuminate, ovate to rhomboid, coarsely toothed, almost green.

1. Leaves longly acuminate; teeth coarse, nearly uniform, resembling the typ. *Ch. album* ...... sub-sp. *viridescens* St Amans.
(= sub-sp. *praeacutum* J. Murr
= ? *Ch. paganum* Rchb.)

2. Leaves, especially the lower, more shortly acuminate; teeth very large, the lower hooked. Much rarer .... sub-sp. *bernburgense* Zschacke (4).

B\. Leaves more or less obtuse, greener on the upper surface than in A.

1. Leaves ovate to nearly triangular, coarsely but bluntly toothed (ausgebissen); glomerules of medium size, moderately grey. A robust, succulent plant, especially common in the South .... sub-sp. *pseudo-Borbasii* J. Murr (5).

1. In sub-sp. *pseudo-leptophyllum* J. Murr in Sched. (*Ch. leptophyllum* Murr, p.p. quoad pl. *tridentinum* of Nutt.), the leaves of the lateral branches exposed to the sun are very narrow, and the inflorescences are very mealy.

2. The sub-sp. *serratosinuatum* J. Murr in Sched. 1921, stands between sub-sp. *subficifolium* and sub-sp. *paucidens*.

3. This plant was at one time regarded, by me and others, as equivalent to *Ch. striatiforme* J. Murr; but from all the authentic specimens it appears to belong to the Grex *viride*.

4. Leaves large, almost trilobate, more sharply toothed; sub-sp. *trigonophyllum* J. Murr, Progr. Gymnas. Feldkirch, 1910 and 1911. *Ch. tridentinum* J. Murr is distinguishable by small olive-green glomerules.

5. Sub-sp. *interjectum* J. Murr stands between sub-sp. *pseudo-Borbasii* and sub-sp. *striatiforme*.

2. Leaves elongate-lanceolate, with almost parallel margins, mostly coarsely but bluntly toothed (ausgebissen); glomerules small, almost olive-green; seed very shiny: approaching *Ch. striatum*, but mostly not hybrid.
    - (a.) Plant more or less small and delicate.
        - (*a*). Inflorescence prolonged, spicate; branches long, flagelliform, decumbent; leaves rather mealy on the under side. A plant of dry banks and roadsides, more common in the South sub-sp. *striatiforme* J. Murr.
        - (*b*.) Inflorescence very loose, racemose-umbellate; erect habit. A plant of loose soil; it bears the same relation to sub-sp. *striatiforme* as sub-sp. *viride* does to sub-sp. *album*. Also occurs mostly in the South .... sub-sp. *concatenatum* Thuill.
    - (b.) Plant robust; tall.
        - (*a*). Leaves with sinuous, sharply toothed margins, the under surface the more mealy. A rarer form (passing into sub-sp. *viridescens*) sub-sp. *pseudo-striatum* Zschacke.
        - (*b*). Leaves clear green on both sides, very obtuse, and distantly and bluntly toothed. Differs from *Ch. striatum* only in the greater divergence of the leaf-margins, and in the larger and more mealy glomerules. Probably of re-crossed hybrid origin .... sub-sp. *substriatum* J. Murr in Vierteljahrheft für Geschichte u. Landeskunde von Vorarlberg, 1920, I. (as var. of sub-sp. *pseudo-striatum*).

CH. OPULIFOLIUM × ALBUM and CH. OPULIFOLIUM × STRIATUM.

I. Leaves markedly grey- or blue-green, rarely dark green. CH. OPULIFOLIUM × ALBUM.

- A. Leaves, especially the upper ones, very obtuse, margin coarsely but bluntly toothed (ausgebessen).
    1. Leaves rather dark green, ovate, flattened out anteriorly. The leaf resembles that of *Ch. opulifolium*, somewhat elongated and obtuse. (Probably a case of re-crossing.) .... *Ch. subopulifolium* J. Murr.
    2. Leaves rather grey-green, very obtuse, and somewhat emarginate at the apex, margin deeply and elegantly doubly sinuous-toothed .... *Ch. Borbasii* J. Murr.
    3. Leaves extremely obtuse; the median lobe has parallel margins with isolated, coarse teeth, the lateral lobes are coarsely bipartite .... *Ch. subquinquelobatum* J. Murr.
- B. Leaves acuminate.
    1. Leaves rather small, elongate-rhomboid, sharply mucronate, margin coarsely toothed (ausgebissen), with sharp lateral teeth; merges into *Ch. Borbasii*. It is a *Ch. opulifolium*, var. *mucronulatum*, with elongated leaves .... *Ch. Preissmanni* J. Murr.
    2. Leaves large, triangular, deeply sinuate (ausgebissen) toothed, somewhat emarginate at the apex, rather green .... *Ch. platanoides* J. B. Scholz.

II. Leaves markedly bright green, although they are often somewhat mealy as well .... CH. OPULIFOLIUM × STRIATUM.

1. All leaves triangular-ovate, broadly rounded anteriorly.
    - (a.) Leaves bright green, slightly toothed or almost entire .... *Ch. Ludwigii* J. Murr.

(b.) Leaves more mealy, margin bluntly sinuate toothed. Plant erect; flowering branches crowded .... *Ch. solitarium* J. Murr.

2. The larger leaves broadly triangular, coarsely and obtusely doubly toothed (much as in *Ch. platanoides*); the smaller lateral leaves ovate, very obtuse, with almost parallel margins .... *Ch. tridentinum* J. Murr.

NEWLY INTRODUCED SPECIES OF THE ALBUM-GROUP.

CH. LEPTOPHYLLUM Nutt. resembles a narrow-leaved *Ch. album*, sub-sp. *lanceolatum*. Leaves linear-lanceolate to elongate-lanceolate (var. *oblongifolium* Wats.), mucronate; they, like the small, crowded inflorescences, are mostly densely mealy. (North America.)

CH. BERLANDIERI Moq. (*Zschackei* J. Murr) resembles an obtuse-leaved *Ch. opulifolium*. Leaves rhomboid to ovate, often indistinctly trilobed anteriorly (distinguishing it from *Ch. album*) clearly rounded but having at the same time a delicate sharp mucro; grey-green. (North America.)

CH. BERLANDIERI × ALBUM (*Ch. subcuneatum* J. Murr). Leaves acuminate from an ovate base, irregularly sinuately (wellig) toothed in the upper two-thirds, less clearly mucronate; not uncommon.

CH. STRIATUM (Kras.) Murr. Leaves like those of *Ch. ficifolium*, very obtuse, but the lateral lobes are only short or inconspicuous; green to bright green, almost shiny; the venation is anastomosing (*i.e.*, the ends of the lateral veins running parallel to the margins run into one another); often sinuately toothed. Branches flagelliform, brightly striped with red. Glomerules small; olive-green. (From Northern India; long established in Central Europe.)

CH. HIRCINUM Schrad. Closely allied to *Ch. ficifolium*. Leaves very variable; the lateral lobes are usually rather elongated and bipartite, and, like the inflorescence, are very mealy. Fetid smell. Generally smaller than *Ch. ficifolium* in all parts, and flowering later. (South America.)

CH. HIRCINUM × STRIATUM (*Ch. Haywardiae* J. Murr). Leaves resembling sometimes those of *striatum*, sometimes those of *hircinum*, but more incised than those of *Ch. hircinum*, and with usually shorter lateral lobes; green, but rather mealy; stem brightly striped red.

(The translation of this paper of Dr J. Murr we owe to the kindness of Dr S. H. Vines.)

†2131 (3). C. HIRCINUM Schrad., var. LATISSIMUM Murr ined. Bradford, Yorks, 1921, G. C. DRUCE and J. CRYER.

†2131 (4). C. BERLANDIERI Moq. × ALBUM L. = × C. SUBCUNEATUM Murr. Meanwood, Leeds, September 1921; Chipping Norton, Oxford, G. C. DRUCE.

2131 (4). C. DRUCEI mihi. *Ch. Berlandieri* × (*album-striatum*). Vorarlbergia: In ruderatis apud Josters pr. Feldkirch, viii., 1909. J. Murr. Accedit ad *Ch. Berlandieri* foliis circuitu fere ovalibus mucronulatis, glomerulis densis, etc.—ad *Ch. album* foliis inferioribus et mediis basi cuneatis deinde undulato-sinuatis (ut in *Ch. subcuneato* mihi)—ad *Ch. striatum* foliis omnibus saturate viridibus, subnitentibus, superioribus et nonnullis lateralibus marginibus sub-parallelis p.p. apice rotundatis, nervatura anastoma, glomerulis sub-olivaceis. Forsan ortum ex commixtione *Ch. Berlandieri* et *Ch. albi*, sub-sp. *pseudo-Borbasii* mihi aut sub-sp. *viridescenti* St Amans. It approaches *Ch. Berlandieri* in the nearly oval outline of its mucronulate leaves, and in its dense glomerules, etc.—[it approaches] *Ch. album* in that its lower and middle leaves are cuneate at the base becoming undulate-sinuate (as in *Ch. subcuneatum* mihi)—[it approaches] *Ch. striatum* in that all its leaves are deep green and somewhat shiny, the upper and some of the lateral leaves having sub-parallel margins and p.p. a rounded apex, with anastomosing venation, and in that the glomerules are sub-olivaceous. Possibly the plant has arisen from the crossing of *Ch. Berlandieri* with *Ch. album*, sub-sp. *pseudo-Borbasii* mihi or with the sub-sp. *viridescens* St Amans. J. MURR.

†2131 (13). C. QUINOA Willd. Sp. Pl. i., 1301. America, austral. Galashiels, Selkirk, Miss I. M. HAYWARD and G. C. DRUCE. A specimen (very incomplete) from Mr Grierson is near this or *C. Atriplicis* Linn. f. (? *purpurascens* Jacq.), teste Murr.

2135 (6). MONOLEPIS TRIFIDA Schrad. Ind. Sem. Hort. Gott. 4, 1830. Alien, Sibiria. Maryburgh, Lanark, and Bowling, Dumbarton, 1921, R. GRIERSON. Det. at Kew. *M. Nuttalliana* has been recorded for Britain. Perhaps they are synonymous.

†2210 (13). RUMEX PARAGUAYENSIS Parodi. Described at length

in *Rep. B.E.C.* 259, 1920, by A. Thellung. Alien, South America. Ware, Herts, 1914, DRUCE; Bristol, N. SANDWITH; Elland and Tingley, York, E. C. HORRELL; Glasgow, GRIERSON. Some, if not all, of the plants named in Britain as *R. dentatus* belong to this species, which in some respects recalls *R. pulcher*. It is difficult to assign its mode of introduction. Dr Thellung informs me that this South American alien has been recently described as *R. obovatus* Danser sp. nov. in *Nederl. Kruidk. Archief*, 1920 (1921), but Dr Thellung does not think it can be specifically separated from Parodi's plant.

2217. VISCUM ALBUM L. On Lime Trees. L. A. Boodle in *Kew Bulletin* 5, 212, 1921. It occurs on *T. europea* in the Oxford Botanic Garden.

2250. URTICA DIOICA L. The variation in leaf-shape of this species is well known, but recently I have seen forms with much rounder leaves than I had previously noticed. These I propose to call var. or sub-var. ROTUNDATA. I saw it at Barpham, Sussex W., in 1918, and Mr T. H. Green sent it from Twerton, Som. N., in that year. The leaf-measurements are as follows :—Middle of stem, 2¼ in. long by 2½ in., deeply cordate; higher up, 27 in. from base of stem, 2¼ in. broad by 2 in.; upper leaves, 5 in. from apex of stem, 1½ in. by 2 in. The leaves are densely hairy, almost rugose in texture, and coarsely toothed. There was no suspicion of hybridity with *urens*.

Forma INCISA mihi, with leaves deeply incised. La Haule, Jersey, 1919, DRUCE.

2312. CEPHALANTHERA RUBRA Rich. In the *Gard. Chron.* 109, 1921, Mr A. D. Webster, the author of *British Orchids*, says *C. rubra* has recently been reported from Gairloch, West Ross [surely an impossible occurrence; doubtless *Helleborine latifolia* or possibly *H. atropurpurea* is meant], but, he continues, "it is growing in some quantity at High Elms, where it was pointed out to me by the late Lord Avebury." Confirmation of this is most desirable, since I have talked over the Orchids with Lord Avebury, and he never mentioned such an interesting record. May it not be *Helleborine purpurata*, which grows there, or may it not have been planted in the grounds? Said to have been found in 1921 growing fairly freely in the neighbourhood of Salisbury ("×" in *Salisbury and Winchester Journal*). In *Gard. Chron.* January 7, 1922, Mr A. D. Webster says he himself, with Mr Marshall Ward, saw *C. rubra* growing at the margin of the racecourse at High Elms.

2316. HELLEBORINE LATIFOLIA Druce. The Messrs Stephenson (*Journ. Bot.* 33, 1921) have a valuable paper on this plant, and on "*media*" and Linton's *atroviridis*. They show that *media* as a name must disappear. In this I cordially agree. The character derived from the more or less rugose-plicate bosses is too feeble and variable to afford a specific character; moreover, the name itself, as has already been shown, is faulty. Fries' *media* consisted of two species, each of which had been named previously. Linton's *atroviridis* is not a distinct species; in my List of 1908 I reduced it to a variety of *latifolia*. Babington's *media* was first correctly identified by him as *viridiflora*, but afterwards he wrongly named it *media*, as Col. Godfery points out. Of course, my var. *platyphylla* of *media* goes without a name into aggregate *latifolia*. Whether the narrow-leaved form of the latter is worth retaining is open for further investigation. The breadth of the leaf varies immensely.

2316 (3). H. LEPTOCHILA (Godfery). In *Journ. Bot.* 146, 1921, Colonel Godfery says the plant described as *Epipactis viridiflora*, var. *leptochila* (*Journ. Bot.* 37, 1919) is identical in its morphology and in the functions of the reproductive organs with *H. latifolia*; therefore, as there is no species under which it can be placed as a variety, he raises it to specific rank as *Epipactis leptochila* Godfr. Under this Messrs Stephenson put as vars. *dunensis* and *vectensis* (*l.c.*, 205, 1921).

2317. H. VIRIDIFLORA (Reichb.). Mr C. E. Salmon (*Journ. Bot.* 20, 1921) has a short note on this plant (as *Epipactis*) from E. and W. Gloucester and Monmouth, in which he thinks the forma *dunensis* may be worthy of varietal rank.

2317. EPIPACTIS VIRIDIFLORA Reichb. Since our note in last year's *Report* was written, it has been discovered by Col. Godfery that Mueller was mistaken in referring to this species the self-fertilising plants whose anatomy he investigated. Naturally, Darwin (*Fertilisation of Orchids* 102) handed on the error. By search at Thorene, where Mueller found his plants, Col. Godfery has proved that *Epipactis viridiflora* is after all just a cross-fertilised form of *E. latifolia*. It is, moreover, quite distinct from all three British self-fertilising forms, and has been named by Col. Godfery as *E. Muelleri* (*Journ. Bot.*, April 1921). It therefore becomes necessary to rename the British forms, and accordingly *E. viridiflora*, var. *leptochila* Godfery, now becomes *E. leptochila* Godfery, and the f. *vectensis* and f. *dunensis* named by us we now assign as *E. leptochila*, var. *vectensis* and var. *dunensis* (*Journ. Bot.* 146, May 1921, and 205, July 1921). Therefore, four self-fertilising forms of *Epipactis* have now been discovered, one in Switzerland and three in Britain. It is, however, probable that the new forms will in time be identified on the Continent. For instance, there is a dune form of *Epipactis* in Germany, of which we have specimens, which is almost certainly the same as our own; but in the dried state it is almost impossible to make out the exact form of the reproductive organs. T. & T. A. STEPHENSON.

2320. ORCHID SEEDS. The germination of the seeds was demonstrated by Mr J. Ramsbottom at the British Mycological Society on January 22, 1921, when he showed that they show no differentiation into plumule and radicle, but often possess larger cells at the suspensor end. The symbiotic fungus enters there, and the growing points of stem and root are situated at the further end of the seed. The root pushes its way through the tissues of the corm, but misses the fungal zone, and is free from the fungus on entering the soil. Later the fungus penetrates the root.

2325. ORCHIS LATIFOLIA L. In *Journ. Bot.* 1-7, 1921, the Rev. T. & Mr T. A. Stephenson discuss this plant. There is little doubt that the Linnean species, like so many others in the *Species Plantarum*, is a compound plant. Linnaeus started well; in the *Flora Suecica* he gave a description, contrasting it with *incarnata* on the one side and *maculata* on the other, but unfortunately, as was his custom, he added synonyms of plants which he had probably never seen, and which in many instances are quite different from the plant he had before him. In these cases it is wisest to ignore the synonyms and to keep to the descriptions, helped as they are occasionally by geographical and stational clues. Therefore, we are constrained to limit *O. latifolia* L. to a plant with hollow stem, with leaves slightly (parum) spotted. The Linnean plant in his herbarium has broad flowers, the centre lobe rounded, bracts conspicuous, and leaves broadest in the middle. So far as British plants go, hitherto I have been unable to meet with plants which are identical with *O. latifolia* sent me from Sweden by Prof. Lindman and from Switzerland by Dr Keller. The Messrs Stephenson, however, consider Britain does yield *O. latifolia*, and they give a description and allude to four groups of which it consists. All of these seem likely to me to be hybrids of *O. praetermissa* with *maculata*, and its allies. Their *latifolia* is stated to have stems more or less hollow. I have found that the greater or smaller stem-cavity is almost uniformly associated with flowers approaching to or receding from *praetermissa*, and this is also true of the leaf-spots, the latter being of less specific value, since, as Messrs Stephenson remark, occasionally *maculata*, *Fuchsii*, and even *mascula* have unspotted leaves. I may add that the nearest approach to the Swedish *latifolia* was sent me from Selkirkshire; such as have been sent me from southern Britain seem to me to be allies or hybrids of *maculata*. It is usually not difficult to rightly prophecy that a certain paler-flowered Marsh Orchid growing with darker-flowered ones will have a stem whose central cavity is in proportion as its flower characters approach either parent. While thus frankly stating that I have yet to be convinced that true *latifolia* occurs in Britain, I am still inclined to hope for its appearance. These valuable researches of Messrs Stephenson may by many botanists be held to prove it. Botanists must be grateful to them for the painstaking and able work they are doing. Even if *latifolia*, British or foreign, should prove to be of hybrid origin, a name will be wanted to cover the enormous range of variation which is to be seen in aggregate *latifolia*, and this might be retained. We are glad also to see Messrs Stephenson refer to the variation in size of *maculata* and *Fuchsii* and to both growing even in sphagnum. In herbaria these large plants are often labelled *latifolia*. Among the flowers figured are *O. pratermissa*, *O. incarnata*, *O. purpurella*, *O. Fuchsii*, *O. latifolia*, and some hybrids. Bearing on this there is a suggestive statement by Sipkes (see *Journ. Bot.* 234, 1921) that, as to *O. latifolia*, he thinks that in Holland it may be all or nearly *purpurella* hybrids, but leaves the question open for the present.

2325 (2). O. PRAETERMISSA Druce, and O. PURPURELLA Steph., in Holland. See "Two Orchids new to Holland," by C. SIPKES in *De Levende Natuur*, June 1921. The author makes no reference to the original description of *praetermissa*, but he saw Messrs Stephenson's good figures of the flower, and was enabled readily to identify it in several places, *i.e.*, near Castricum, Halfweg, Aalsmoor (Holland), Heille, Croede, and Oostkapelle (Zealand). The Hielle plant possesses a long narrow extension of the lip, which he described (*Kruid. Archief*, 1918) as *O. latifolia*, var. *macrantha*. He discusses the question of its being a possible hybrid, but says the most important argument against hybrid origin is that possible parents never grew near these specimens. As he has not seen my original paper, he is unaware of a still more important argument against hybridity there given, that it reproduced by seed offspring like the parent. He finds *O. purpurella* in South Limburg, near Epen, where it is very frequent. This plant, like *praetermissa*, was previously mistaken for *latifolia*. The hybrids from the Coul Valley are not, as he thought, *latifolia* × *maculata* (*O. Braunii*), but *purpurella* × *maculata*, and he thinks there is a possibility that all the Dutch *latifolia* are *purpurella* × *maculata*. Mr Sipkes thus independently has arrived at my suggestion regarding the English *latifolia*, that it is *praetermissa* × *maculata*, both these species being used in an aggregate sense—that is, that under *praetermissa* I include its var. *pulchella*, and sub-sp. *purpurella*, and under *maculata* come type *maculata* (*praecox*), *Fuchsii*, and *O. O'Kellyi*. Therefore, one need not wonder at the extreme variability of what passes as *O. latifolia* L., both in Holland and Britain. G. C. DRUCE.

2326 (3). O. PURPURELLA Stephenson. In the *Journ. Bot.* for July 1920 we described a new species of Marsh Orchis, under the name of *O. purpurella*. The lips of this form are figured in the same journal in November 1920, pl. 556, figs. 9 and 10 (coloured), and May 1921, pl. 559, figs. 9 and 10. See also *The Orchid Review*, December 1921. The chief points of distinction are (a) the deep, brilliant purple of the flowers: (b) the dwarf habit of by far the most of the plants; (c) the leaf-spots, which are very small, often minute, and often present only at the tips, or more rarely at the bases of the leaves (as in all spotted species, a proportion of the plants is unspotted); (d) the pointed, almost, if not quite entire, diamond-shaped lip of the most typical form. We distinguished two forms, namely, form (a), with the diamond-shaped lip, and a lip-pattern of very heavy, broken lines of dark purple, and form (b), with more rounded and trifid lip, with small, rounded centre-lobe, and a pattern of rather narrower and more continuous lines, of the *latifolia* type. At that time we only knew form (a) from Aberystwyth, where we had had a field containing some hundreds of plants under observation for some years, and form (b) from Hawkshead, near Ambleside, and from the Isle of Arran. Since then Dr Druce has found form (a) at Port Madoc, and the species has been found in Holland by M. Sipkes. Some plants referred to *O. cruenta* from Cumberland and Durham also probably belong here. One possibility that had to be considered was whether the plant is *O. cruenta* O. F. Mueller. For some time we were unable to speak with finality upon this point, not having seen any living specimens of the latter, though our plant does not agree with the original plate (t. 876) in *Flora Danica*, nor with the description there given. Moreover, both Klinge and Ascherson & Graebner place the species in the closest connection with *O. incarnata*, in the latter case as a sub-species. We have recently examined a sheet of very well-preserved specimens in Dr Druce's herbarium, and can say confidently that *O. cruenta* is much nearer to *O. incarnata* than is *O. purpurella*. It has the same habit of leaves, and the same small flowers with recurved side-lobes of the lip, and a very similar lip-pattern. *O. purpurella* has broader leaves and a larger, flatter lip, with a very different pattern. *O. cruenta* has a more slender spur and a very different type of leaf-markings. As compared with the minute dots of *O. purpurella*, it has not only more heavy, angular markings, but also bright purple blotches on both sides of the leaves. Ascherson & Graebner also give a form B, *Seemenii*, dwarf (9-12 cm. high), with small flowers, almost entire, mostly of a dull (schmutzig) pale pink, the lip small, almost entire, with greenish marks. This form is given for the middle and North of Great Britain! What the form is, and how it got recorded for Britain, we have no idea. It is very certain that we should not dream of making *O. purpurella* a subspecies of *O. incarnata*, from which it is markedly distinct. The question was carefully considered as to whether the plants were hybrids of some sort, and, as found in some situations, there are considerations which might point that way, but the group of plants growing at Aberystwyth, where there are some hundreds of specimens, all very true to type, as far as the flowers are concerned, of a rich, brilliant colour which could not have been produced by any crossing, far deeper and richer than any other type in the neighbourhood—we do not think these would be diagnosed as hybrids by any botanist who saw them on the spot. Moreover, they appear themselves to hybridise very readily with other forms, and we have determined with some certainty several intermediate forms. *O. purpurella*, form (a), with *O. latifolia* and *O. ericetorum*, and form (b) with the same two species and with *O. Fuchsii* and *Gymnadenia conopsea*. In the last case there are two types, one nearer one parent and one nearer the other, of which one is reproduced in the *Orchid Review* for November 1921. The two hybrids of form (a) are figured in the *Journ. Bot.*, November 1920, in the plate above referred to, figs. 11 and 12. In the *Journ. Bot.* for February 1922 we have named and briefly described these various hybrids, as follows:—1. × *O. insignis*, nobis = *O. purpurella* Stephenson × *O. latifolia* L.: 2. × *O. venusta*, nobis = *O. purpurella* Stephenson × *O. ericetorum* Linton; 3. × *O. venusta*, nobis = *O. purpurella* Stephenson × *O. Fuchsii* Druce: 4. × *Orchigymnadenia varia*, nobis = *O. purpurella* Stephenson × *Gymnadenia conopsea* R. Br. Of this two forms were found, type A being nearer to the *conopsea* parent, and type B being nearer to the *purpurella* parent. The last hybrid is only known from a very few specimens from Arran; but the other three are represented by a relatively large number of individuals in most localities in which *O. purpurella* has been found. They are so numerous, in fact, that it is most inconvenient not to have names for them. There is one other Marsh Orchis that must be mentioned in this connection. Dr Druce has long had under observation a plant which he has called "Northern *incarnata*." That plant he described in the *Rep. B.E.C.* for 1919 as *O. praetermissa*, leaving its exact status undetermined. When writing the paper on *O. purpurella* we had no acquaintance with this form in the field, only being sure from the literature and specimens examined that the two were very nearly allied, as the argument of our paper will testify. However, this summer we were able to see *O. pulchella* in great beauty and fairly plentiful in the Isle of Arran, and there found it in several stations growing alongside *O. purpurella*, form (b), from which they only differed in being on the average a great deal larger, and without spots on the leaves. We found a fair number of dwarf plants without spots, and a few tall and slender plants with spots. Here, then, the two forms are commingling in some way, but, so far as present records serve, this does not often happen. At any rate, the fact that they are to be found in the main apart makes it desirable to retain the two names; but they should certainly be linked together as very close allies. They probably only differ by the presence or absence of the unit (Mendelian) characters for "leaf-spot" and "dwarfness." We suggest that they form a pair of species of a somewhat simpler type than those discussed in the interesting paper on "Pairs of Species," by Dr R. R. Gates, published in the *Botanical Gazette* for March 1916. We therefore venture to suggest that *O. pulchella* would be best separated from *O. praetermissa*, from which it differs in the colour-range and texture of the flowers, and the lip-pattern, and in its geographical distribution, as it appears almost entirely to displace the latter species in Scotland. T. & T. A. STEPHENSON.

Orchis cruenta was first recorded for Britain by Mr H. Goss from "the fells between Borrodale and Watendlath, Cumberland—alt. about 1000 feet" (*Journ. Bot.* 37, 1899), on Mr Rolfe's identification. I visited the place on two or three occasions, but was unable to see any plants answering to the description. Subsequently Mr Rolfe also named some specimens which I gathered near Middleton in Teesdale (see *Rep. B.E.C.* 521, 1910) as *O. cruenta*. These come under *O. purpurella* Stephenson. G. C. DRUCE.

2327. O. MACULATA L. In *Journ. Bot.* 305, 1921, Col. Godfery suggests replacing the name *O. ericetorum* Linton by that of *O. elodes* Grisebach in Ueber die Bildung des Torfs in den Emsmooren 25, 1846. There is nothing in the description to keep it apart from *O. maculata* L. as a species, and *elodes* may either sink in synonymy or be reduced to a variety if it is sufficiently distinct. Grisebach makes no mention of the important character of the size of the side-lobes of the labellum. It will be noticed in this paper that Col. Godfery ignores the excellent description of *O. maculata* by Linnaeus and uses, as I think most unjustifiably, the name *maculata* in the sense of *Fuchsii*. He offers no explanation for this course, nor is his account of *O. elodes* itself exhaustive, *e.g.*, he has omitted to take any notice of Reichenbach's *O. elodes* Griseb. (see *Ic. Fl. Germ. et Helv.* xiii.-xiv., t. 406. Is the plant figured the restricted *ericetorum*?). His figures of the details of *O. maculata* show that both *Fuchsii* and *maculata* are included under the latter name. As to the occurrence of true *O. maculata* (*ericetorum*) on the continent, Col. Godfery does not appear to have taken the trouble to consult any of the great herbaria, which would easily have afforded the necessary information, or to have examined any extensive area. It was abundant on the moorland above Spa in Belgium in 1921. Indeed, the description of *O. maculata* in Lejeune & Courtois' *Comp. Fl. Belg.* excludes *Fuchsii*. One regrets to see such an untenable name suggested, which can only create confusion. I may add that when I was selecting a name for the basic-soil plant *O. elodes* was well considered by me as an equivalent for *ericetorum*, but was rejected. Both Dr Moss and myself were convinced that, as in the case of *Quercus Robur*, there was no doubt as to what Linnaeus meant when he described *maculata*, and that *Fuchsii* (or its equivalent) was to be separated. Miller took the same erroneous course as Col. Godfery suggests when he gave the name *Robur* to the sessile Oak and re-named (still-born) the true *Robur* as *Q. foemina*.

2327. O. MACULATA L. A paper on the forms of this plant by the Rev. T. Stephenson, D.D., and Mr T. A. Stephenson appears in *Journ. Bot.* 121, 1921. They treat of (1) *O. Fuchsii*, which they consider in some characters is intermediate between *O. latifolia* and *ericetorum*; (2) *O. O'Kellyi*, which they regard as a race (not a species) of *O. Fuchsii*; and (3) *O. maculata*, sub-sp. *ericetorum*. *O. maculata* is, as the authors say, an extremely variable species, yet by the segregation of *O. Fuchsii* the limitations are rendered much less difficult. Messrs Stephenson support what I have stated regarding the identity of Webster's *O. maculata praecox* and Linton's sub-sp. *O. ericetorum*. Both these authors argued from a much too limited amount of material. Neither of the names seem to me necessary. Linnaeus, in his treatment of *O. maculata*, was not content in this instance with a descriptive phrase and a citation of synonyms more or less applicable to the species, but adds a descriptive footnote—" Petala 3 exteriora erecta, 2 interiora conniventa. Nectarii labium trifidum, planum: lobis lateralibus majoribus crenatis: intermedio angustissimo, integerrimo," which covers not only *praecox* and *ericetorum* but the recently disinterred *elodes* of Grisebach, which seems to me, in a specific sense, a still-born name. The specimen, too, in the Linnean Herbarium is *maculata*, not *Fuchsii*. As Messrs Stephenson well say, Webster and Linton " re-described the Linnean *maculata*," doubtless led into this error by the plate in *English Botany*. I dissent from Messrs Stephenson's contention that the description of *maculata* in the foreign floras generally refers to *Fuchsii*. On the contrary, when the species is minutely described I think it will be found that *maculata* is indicated: often the description is so wide, and where both species are fairly common in the area under discussion this may have been intentionally done, as to cover both *Fuchsii* and *maculata*, which the authors may have thought to be forms of one variable species. May I say also that, if usage in one country or another is contrary to the original description of any species, it is invalid and must fail. With regard to *O. maculata*, such usage is not universal nor even general. In *Rep. B.E.C.* 99-108, 1914, I have shown how variable was the practice. Take, for instance, Archangeli *Fl. Ital.* 170, where the description is clearly not *Fuchsii*, and the same is true of Lejeune & Courtois' *Comp. F. Belg.*, Lloyd's *Flore de l'Ouest*, Bouvier *Fl. des Alpes*, Grenier & Godron *Fl. de France*, Post *Flora Syria, Palestine, and Sinai*, Brébisson *Fl. Normandie*, Rouy & Foucaud *Fl. de France*, etc.; whereas Koch *Fl. Germ.* and other authors give so vague a description that both species are covered. The authors of the paper give a whole-page illustration of the flowers of the palmate section—a most valuable addition to an important paper.

2327. O. MACULATA L., var. SUBINTEGRIFLORA Druce. Differs from the type by the labellum being nearly circular in outline, with a central shallow notch in which sometimes there is a very small and short central lobe rarely reaching the margin; the margin is entire, faintly cut, or slightly crenate. The markings are various, usually dark purple on light lilac, and are usually in broken lines. Moors above Dolgelly, Merioneth.

[2333. OPHRYS BOTTERONI Chodat. Under this name my friend, Mr G. W. Harris, gave me specimens from the neighbourhood of Folkestone, but Prof. Chodat, to whom I sent them, does not admit them as his plant, but refers them to a form (which is common in Switzerland) of *arachnites* Lam. = *fuciflora* Reichb. This season further search will be made. In true *O. Botteroni* Chodat the inner sepals are petaloid.]

2335. O. APIFERA Huds. The Fertilisation of, by Col. M. J. Godfery, in *Journ. Bot.* 285, 1921. Contrary to preconceived belief, the author finds that it is mainly self-fertilised, although the plant is so specially organised for cross-pollination.

2338. HABENARIA GYMNADENIA × ORCHIS PURPURELLA. Under the combination *Gymnadenia conopsea* × *Orchis purpurella*, Messrs Stephenson in *The Orchid Review* 131, 1921, record the discovery of this hybrid in the Isle of Arran, and give a beautiful photograph of it. With it they found plants which they regard as hybrids of *O. purpurella* with *latifolia*, with *Fuchsii*, and with *O. ericetorum*.

†2380. LEUCOJUM PULCHELLUM Salisb. In March 1921 Mr P. M. Hall kindly sent me a specimen of a *Leucojum* which was said to be quite wild-looking in fields near Brightstone, in the Isle of Wight. I recognised it as the Balearic *L. pulchellum* and therefore went to Brightstone to see in what condition it grew. I soon found the field, in which there was a number of large clumps growing in and about a double hedge bordering a pasture field close to the village. These clumps were very luxuriant and covered with blossoms. In the field there were also plants of *Narcissus major* which, from these being in regular rows, dispelled any idea of either species being indigenous. Prolonged inquiry elicited the fact that both the *Leucojum* and *Narcissus* were planted some years ago by a schoolmaster, but that the former had considerably increased in number. Several gardens in the neighbourhood contained the *Leucojum*, and the villagers call it the Mountain Lily or Snowflake. G. C. DRUCE.

†*Gen.* 586 (5). MILLA Cav. Ic. ii., 76, t. 196, 1793.

†2392 (5). M. UNIFLORA R. Graham in Edinb. Phil. Journ. (833)

74; Bot. Mag., t. 3327. *Triteleia uniflora* Lindley Bot. Reg., t. 1293. Alien, Argentine. Hortal. Golf links, Grouville, Jersey, 1921, S. GUITON, ex T. ATTENBOROUGH.

†2409. SCILLA BIFOLIA L. I included a notice of this in "The Dubious Plants of Britain" (*Rep. B.E.C.* 789, 1919), and gave the following references to its supposed occurrence in Britain:—Teignmouth, Devon, Mrs Gulson, who "found only a few specimens which she brought into her garden, and that the plant was not now to be found in the neighbourhood."—Syme *Eng. Bot.* ix., 226. "Received from the West of England by Mr Sims, druggist, of Norwich. It is also in Buddle's herbarium (containing native species only)."—Sm. *Fl. Brit.* 365, 1800. The plate in Smith's *English Botany*, n. 24, is from a garden specimen. Its continental distribution is not adverse to its being a native in Britain; but so pleasing a plant is scarcely likely to have escaped observation. This year our good worker at Carmarthenshire plants, Mr D. Hamer, sent me a flower of this species which had been gathered in grass sward near the sea, a few feet above high water mark, on the Carmarthenshire coast. The exact locality is intentionally withheld. It is not a great distance from houses, and only two specimens were observed; thus its occurrence here may be adventive only. It would be interesting to know if it is grown in gardens in the neighbourhood. Perhaps investigation may discover it in greater quantity over a wider area.

†*Nat. Ord.* 91 (2). COMMELINACEAE.
Gen. 600 (5). COMMELINA (Plum.) L.

†2425 (5). C. COMMUNIS L. Alien, Asia. Leith Docks, Midlothian, September 1921, J. FRASER.

[2449. JUNCOIDES SYLVATICUM (Gaud.) Druce, var. JOANNIS-PRINCIPIS (Murr). *Luzula multiflora* × *sylvatica*. Frequent with the parents in Monte Rojaberg, prope Feldkirch, Austria, May 1921, J. MURR. This very interesting hybrid should be sought for in Britain, where both parents grow together. It has the strong growth and broad leaves of *sylvatica* with the inflorescence (modified) of *multiflora*.]

pusillus

2506. POTAMOGETON OBTUSIFOLIUS M. & K., sub-sp. LACUSTRIS Pearsall, pat. et fils, in Journ Bot. 100, 1921, from the Lake District, formerly (*Rep. B.E.C.* 841. 1919) recorded as *P. Sturrockii* Ar. Benn., but not the *Sturrockii* Ar. Benn. of *Scot. Nat.* 28. 1883.

2599. CAREX SPICULOSA Fries Bot. Notiser 99, 1843; Fries et Nylander Spic. Pl. Fenn. 21, 1844; Fries Sum. Veg. Scand. 226, 1846. *C. Goodenowii juncella* × *cuspidata* Almquist in Bot. Not. 18, 1891. *C. salina* × *vulgaris juncella* Hjell. Consp. Fl. Fenn. 285, 1895. *C. spiculosa* is recorded (Andersson *Cyp. Scand.* 41. 1849) by Nylander in promontorio maris albi arido Kuusokatka ad pagum Keret Lapponiae Rossicae. *C. salina*, var. *C. spiculosa* Richter Pl. Europ. 154, 1890. *C. salina*, var. *hebridensis* Ar. Benn. in Ann. Scot. Nat. Hist. 246, 1895, and 172, 1905. See also *Journ. Bot.* 252, 1897. The British locality is in North Harris, by brook at Loch Langavat, 2 miles north-west of Awhuimsnid, north of Obbe: covering a space about 2 or 3 yards long, by the same width, and among a sprinkling of heather above the brook. If there were any other Carices mixed with it I don't remember seeing them, but a little farther from the brook there were several Carices, where it was found by W. S. Duncan in 1895. Not being able to make this agree with any other *Carex* (than *spiculosa*), I felt dubious, as the rarity of the Finnish *Carex* seemed to exclude it, but I sent specimens to Dr Almquist, of Stockholm, who had worked at this section of the genus for many years. He replied—" 20/7/95.—Your *Carex* really resembles *spiculosa*, though, as you say, not exactly identical, and is undoubtedly the same hybrid." On this it seemed best to make it a var. of that species. The following references may be added:—Angström.—" Ytterligare underiältelser om botaniska resor i Skandriien af E. Fries Botaniska Notiser p. 51. 1844. *Carex spiculosa* Fries in Karelia keretina, Pergamo och Kalgolatis." Lang in Linnaea xxiv., 552, 1851.—" Cl. Friesius Cariciem spiculosam ad stirpem Caricis maritima refert, sed, ut mihi videtur, transitum optime facit a Cespitosis ad Salinas." AR. BENNETT. The chief difference between type *spiculosa* (which seems to be a hybrid and not a species) is in the elongated glume of the Scottish plant not being serrulate.

2611. C. REMOTA L., var. SUBLOLIACEA Asch. & Graebn. Syn. 67. *C. tenella* Sm., non *Engl. Fl.* iv., 83. 1828, non Schkuhr. " *C. remotiuscula* Willd." Don MS. *C. straminea* Don ?if of Willd.

Differs from the type in its much smaller and fewer-flowered spikelets with more silvery glumes. It is probably a condition of dry soils. Originally gathered by George Don in woods by the River Esk, Forfarshire, whence I have specimens (see *Don Memoir* 189, as *straminea*). Odiham, North Hants, 1880, Miss C. E. PALMER. Rozel, Jersey, 1851, J. PIQUET. Near Stoke Row, Oxfordshire, 1884; Riever Wood, Berks; Loch Coulin side, West Ross, 1882, DRUCE.

2628. C. PULICARIS L., forma MONTANA Pugsley in Journ. Bot. 106, 1921. Differs from the lowland form by its more erect fruit, smaller stature, shorter spikelets, with fewer flowers and more erect perigynia. It occurs in Aberdeen, Westerness, Mid Perth, Forfar, Somerset, Carnarvon, and Kerry, where I gathered it in 1875. This may also be the Helvellyn specimen gathered by Bentham in 1823. More recently Mr Pugsley has re-gathered it at Cwm Idwal.

†2641. SETARIA Beauv. Schinz & Thellung, *l.c.*, 258, admit the priority of the Lichen genus *Setaria* Acharius, but on the grounds of expediency they retain *Setaria* Beauv. for the grass genus, pointing out that the correct reference for the name is not (as given in the *Brit. Pl. List*) Flore d'Oware ii., 80, 1807. The name appears in the part which was not published until 1818. The first publication of the name was in the *Agrostographie* of 1812.

†2641. S. VERTICILLATA (L.) Beauv. Schinz & Thellung (*Viert. Nat. Ges. Zürich* 257, 1921) show that the earliest exact trivial is *verticillata*, dating from the second edition of *Sp. Pl.* 1762. Since the *Cynosurus paniceus* of L. Sp. Pl., 1753, is not this plant *paniceus* in the sense of *verticillata* must be abandoned.

2662 (11). S. BERTEROANUS (Trin.) Hitchcock & Chase in Contr. U.S. Nat. Herb. xviii., pt. 7, 370, 1917. Hitchcock in U.S. Dept. of Agric. Bull. No. 772, 150, fig. 84, 1920. Alien, America. Bradford, Yorks, 1919, J. CRYER.

†2665. ALOPECURUS BULBOSUS Gouan, var. MACROSTACHYUS Coss. Expl. Alg. *A. macrostachyus* Poir., ex Lam. Enc. Contrasts with the type—panicule spiciforme cylindrique à rameaux portant 4-6 épillets; glumes longues aiguës, libres, ciliées sur la carène; glumelle unique tronquée, 5 nerviée. Coast of Algeria, in wet

places. Its inflorescence, having fewer and larger spikelets, distinguishes it from the type. Alien. Espartal. Leith Docks, 1921, J. FRASER.

†2669. STIPA PENNATA L. See "Dubious Plants," *Rep. B.E.C.* 793, 1919. In Mr J. Piquet's herbarium there is a specimen labelled Georgetown, Jersey, 1850, but doubtless only a garden escape.

Gen. 649 (2). MUHLENBERGIA Schreb. Gen. 44, 1789.
2671 (10). M. RACEMOSA (Michx.) B. S. P. (*M. glomerata* Trin.). Alien, Amer. bor. Glasgow, 1921, R. GRIERSON.

2685. AGROSTIS TENUIS Sibth. Fl. Oxon 36, 1794. The Latin name for the Common Bent Grass for many years in general use in Britain was *A. vulgaris* With. Arr. ii., 132, 1796; indeed, as such it appeared in the ninth edition of the *London Catalogue* of 1895. In the *Flora of Berkshire* of 1897 I showed that Sibthorp's name had priority, under which it appears in the *British Plant List* of 1908. Richter (no doubt unintentionally) gave a false priority to Withering's name by attributing the date of publication to the edition of 1776, in which the name is not to be found. There is now another claimant brought in by Schinz & Thellung (*l.c.*, 261, 1921). This is *Agrostis capillaris* L. Sp. Pl. 62, 1753, a name used for it by Hudson (*Fl. Anglica* 27, 1762), by Leers (*Fl. Herborn.* 20, t. iv., f. 3), Stillingfleet, Villars (*Fl. Dauph.* ii., 73), and other authors. More recently Hitchcock, the well-known authority on the Grasses of North America (U.S. Dept. of Agric., No. 772, 129, 1820), showed that this name was applicable to the Common Bent and not to the Spanish and Portuguese plant, the *A. delicatula* of Pourret, to which Richter and other botanists had applied it, despite the fact of the Linnean diagnosis being unsuited. Linnaeus, moreover, gives as its habitat "in Europae pratis," and cites *Flora Lapponica* and *Flora Carniolica*, neither countries being the home of *delicatula* Pourret, though the Bent Grass occurs in both. Nyman (*Consp.* 802) cites *A. capillaris* L. as *A. vulgaris* With., p.p. Smith (*Eng. Fl.* i., 93) unjustly gives priority to *vulgaris* rather than to *tenuis*, and says (on wrong authority?) that *A. capillaris* L. is "a totally different plant found in Portugal." Accepting this decision of Hitchcock and Schinz & Thellung as valid (awkward as it will be to agriculturists), the name of the Common Bent must be *A. capillaris* L., while the Iberian plant is the *A. delicatula* Pourret. *A. capillaris* L. is a rather variable species, of which the following are the chief varieties :—

Var. NIGRA (With.). A strong, coarse grass, somewhat intermediate between *capillaris* and the plant generally known as *A. alba*, with prominent oblong, truncate ligule; the panicle-branches constantly erect-patent, bare of flowers below; the florets larger; the glumes relatively longer than the palea; the lower glume more strongly serrulate for half its whole length (in the type a third of the whole length); the leaf-sheath slightly rough, and in its taller growth and more robust habit. Thus in the ligule it approaches *A. alba*.

Var. HUMILIS (Asch. & Graebn.).

Var. PUMILA (L.). Caespitose; plant very small; florets infested with *Tilletia sphaerococca*, to which its characters are said to be due. General Munro considered it to be a good species, but it is said to revert if the smut is destroyed. Confirmative evidence on this point is needed.

Var. DUBIA (DC.) = var. ARISTATA Parnell, an awned form, is not very rare. It is possible that some of the awned forms are hybrids with *canina*.

Var. STOLONIFERA (Koch Syn. 782), with long, creeping stolons. Sandy places. This is in part the *A. stolonifera* L.

Var. ALPIGENA (Schur Enum. Transs. 723). To this I refer some plants gathered on the Cairngorm in 1919 having a short, ovoid panicle of small, dark-coloured spikelets, the panicle branches and peduncles slightly scabrous.

2687. A. CANINA L., var. PALLIDA Reichb. = sub-var. PALLIDA Druce Rep. B.E.C. 312, 1918. Methven, Perth, DRUCE.

2687. A. CANINA L., var. MONTANA Hartm. Cairngorm, Easterness, 1919, G. C. DRUCE.

†2719. AVENA STRIGOSA Schreb., segregates. No mention is made of *Avena strigosa* in this country in the two early botanical works, Ray's *Synopsis* (1724) or Hudson's *Flora Anglica* (1762), though in the former four cultivated types of *A. sativa*, besides *A.*

nuda, are enumerated. In Linnaeus' *Systema Plantarum* (1791) the species is described "panicula oblonga contracta secunda: flosculis geminis biaristatis; dorsa arista geniculata," and quoted from Schreber's *Spic. Fl. Lips.* p. 52. In Smith's *Flora Britannica* (1800) it is referred to as not indigenous. At the present time, apart from being a widely-distributed weed in cornfields, *A. strigosa* in its un-improved state is grown as a crop at the extreme limits of cereal cultivation in the mountainous districts of Wales, and also in the Shetland Islands, Orkneys, and some of the Hebrides (e.g., Tiree), under climatic and soil conditions in which other varieties of Oats cannot be profitably grown. A number of different lots of seed have been obtained from all these various sources, and during the past three years many hundreds of plants have been bred and critically examined by the writer. The result of this research has convinced the writer that three distinct types have been included under the aggregate name *A. strigosa* Schreber. Not having access to large libraries at the time of writing, I have been unable to consult some continental works, but so far as I am aware the species has hitherto not been sub-divided, and no varieties have been described. The three types are perfectly constant when grown from seed, and all their characters are unaffected by environment. I therefore propose sub-specific rank for these types, and suggest the names appended to the descriptions below. The flowers of *Avena strigosa* are very rarely cross-pollinated, and as yet no natural crosses between these sub-species have been observed. There are several varieties of these sub-species, distinguished by the colour of the outer palea when ripe: these appear to be comparable to the colour varieties of *A. fatua* L. and *A. sterilis* L. and their cultivated derivatives.

AVENA STRIGOSA Schreber, sup-species PILOSA mihi. Margo laminae ciliata. Palea inferior tota pilosa; circa 20 mm. longum habet. Young plants sub-prostrate, later becoming erect, but leaves spreading, leaf-sheaths pubescent. *Cilia on the margins of the lamina* extending from the ligule to near the apex. Outer palea of both flowers clothed with long, stiff, ascending *hairs over practically the whole of its surface.* Axis at point of attachment of lower grain practically glabrous (occasionally a few extremely short, white hairs present). Apex of rachilla of lower grain provided with a dense bifurcated tuft of white hairs. Average length of outer palea from the callus at base to the apex of the two hair points when ripe, 20 mm.

Var. *alba.* Outer palea whitish in colour when the grain is ripe.

Var. *fusca.* Outer palea streaked longitudinally with narrow lines of light colour over the vascular bundles, and grey on the intervening tissue.

Almost always present with sub-species *glabrescens* as a crop in Wales, and elsewhere as a cornfield weed, var. *fusca* being the more common variety.

Sub-species GLABRESCENS mihi. Margo laminae ciliata. Planta erectior quam sub-sp. *pilosa.* Palea inferior epilosa; circa 19 mm. longum habet.

Young plants sub-prostrate, afterwards erect; leaves sub-erect at time of emergence of panicles. *Marginal cilia* from the ligule to near the apex of the lamina. Outer palea of all grains *entirely glabrous.* Base of lower grain also glabrous, but apex of rachilla with a bifurcated tuft of light-coloured hairs (just below the point of attachment of the upper grain). Average length of outer palea from callus at its base to the apex of the two hair points, when ripe, 19 mm.

Var. *albida.* Outer palea yellowish-white, with no indication of longitudinal streaking when ripe.

Var. *cambrica.* Outer palea of grain when ripe longitudinally streaked with dark grey and yellowish-white; the light-coloured stripes being narrow, over the vascular bundles only, the darker ones occupying the intervening tissue.

The prevailing sub-species in Wales, but also widely distributed in Britain, var. *cambrica* is the more common variety; var. *albida*, however, frequently accompanies it.

Sub-species ORCADENSIS mihi. Margo laminae non ciliata. Palea inferior, matura, ab arista ad apice pilosa; circa 17 mm. longum habet.

Young plants sub-prostrate and leaf-sheaths pubescent, as in the two foregoing sub-species, but there are *no marginal cilia* on the laminae. Outer palea of both grains *scantily clothed with stiff* *ascending hairs* from immediately below *the point of attachment of the awn to near the base of the two apical hair points.* Whole of the remainder of the outer palea below the attachment of the awn *entirely glabrous.* Grain more nearly ovate than either of the two sub-species described above, although the apical hair points are as long. Apex of rachilla of lower grain bearing a small tuft of short hairs. Average length of lower grain when ripe, from callus at base to apex of two hair points, 17 mm. When growing under the same conditions this sub-species flowers and ripens its seed earlier than the sub-species *pilosa* and *glabrescens.*

Var. *flava.* Outer palea of ripe grain yellowish, not streaked with darker colour. Hairs at the base of the lower grain very short.

Var. *intermedia.* Outer palea streaked longitudinally with greyish-brown stripes, covering the space between the vascular bundles, over which alone are lines of a yellowish colour.

Var. *nigra.* Outer palea of ripe grain completely black or with extremely narrow longitudinal stripes of slightly lighter colour immediately over the vascular bundles.

Apparently almost confined to the north of Scotland, var. *intermedia* is the most common variety, var. *nigra* frequent, but var. *flava* only occasionally met with.

It may be mentioned that, despite repeated attempts, I have so far been unsuccessful in producing crosses between any of the varieties of *Avena strigosa* and other species of the genus, whereas artificial crosses between *A. fatua*, *A. sterilis*, *A. sativa*, and *A. nuda* have been obtained comparatively easily. This is perhaps less surprising in view of the recent work of Hitoshi Kihara in Japan. He has found the diploid number of chromosomes in *A. strigosa* to be 14, while that of *A. fatua*, *A. sativa*, and *A. sterilis* is 42. He suggests that *A. strigosa* is the most primitive of these species and may have given rise to *A. barbata*, the somatic nuclei of which have 28 chromosomes. It is not possible at present to say whether the three sub-species and varieties described above differ in this respect, but a thorough cytological investigation is in progress at the time of writing, accompanying genetical analysis of all these types by inter-crossing. C. V. B. MARQUAND.

†2720. A. STERILIS L. To this species Marquand refers the plant described by Hackel (*Rep. B.E.C.* 37, 1911) as *A. sativa* L., nova forma *glumaris*. I gathered it at Port Meadow, Oxon, in 1910, but it did not reappear. Hackel said it was a form previously unknown to him, approaching by its long sterile glumes *A. longiglumis* Dur., but quite distinct from it. *A. sativa*, forma *glumaris*, thus sinks in synonymy. I have *A. sterilis* also from Acton, Middlesex, and Colchester, Essex. G. C. DRUCE.

2743. KOELERIA VALLESIANA Bertol., ex Roemer & Schultes Mant. ii., 346, 1824 (as *valesiana*, prececes, teste Schinz & Thell.) Ascherson & Graebner as the authority.

2761. POA TRIVIALIS L., var. SEPTENTRIONALIS nov. var. In Shetland the common form of the above species appears to be a different race from the southern plant. For this variation the above name is suggested. Its chief features are that it produces more of the elongate aestival barren shoots from the base of the stem. Sometimes these are prostrate and give it the appearance of *pratensis*, sometimes ascending. Should this latter character be retained in culture the plant must be of superior economic value. The chief differences, however, are in the panicle branches and spikelets. The colour of these is a rich, dark violet-brown, but since it is only the centre of each glume and pale which is coloured while the tips have a broad silvery hyaline margin, a variegated appearance is given. The glumes are about 15 per cent. longer and about 20 per cent. broader than those of the type. The mid-rib is more prominent and is practically glabrous. From the larger florets and slightly shorter flower stalks the effect is given of a more crowded and a more luxuriant panicle. In Shetland, at Lerwick, North Roe, Ronas Voe, Unst, Norwick, Balta Sound, Burrafirth, Uyea Sound, Bressay. A closely allied plant occurs in western Ross-shire. Mr Murray, of Messrs Sutton's, who has had considerable experience with *trivialis*, tells me that none of their examples, whether grown from wild or cultivated seeds, have such large glumes, even when compared with luxuriant examples, and he thinks it worthy of varietal rank.

2811. BROMUS HORDEACEUS L., var. PSEUDORACEMOSUS Asch. & Graebn. Syn. Alien? Near the Railway Station, Killin, Mid

Perth, 1920, J. FRASER; Glasgow, 1921, R. GRIERSON; Port Patrick, Wigton, J. FRASER. An attractive variety from the broad membranous border to the glumes and by its neat-looking glabrescent spikelets. Named at Kew, but placed under sub-sp. *leptostachys* Pers. by Dr THELLUNG. I think it deserves a varietal name.

2845. PHOLIURUS Trin., vice LEPTURUS Br. Hitchcock (U.S. Department of Agriculture Bull. No. 772, 105, 1920) rightly points out that *Lepturus* Br. = *Monerma* Beauv., having only a single glume in the spikelet. Trinius expanded the genus by including species of *Lepturus* having two glumes. If, as is now commonly done, the two genera are to be kept separate—then, according to the Internat. Rules, Art. 45, the name *Lepturus* can only be retained in its original sense for *Monerma*, and cannot, as is frequently and erroneously done in modern times, be retained for the species having two glumes. The name *Lepturus*, auct. rec., should be replaced by *Pholiurus* Beauv., sens. ampl. (em. Hitchcock). The species, which has made its appearance in Switzerland, they regard as specifically different from *Pholiurus incurvus*, comb. nov., and have given it the name *Ph. filiformis* (Roth) Schinz & Thell. (see *l.c.*, 265).

2848. HORDEUM NODOSUM L., var. BREVISUBULATUM (Trin.) Thell. Alien. Greenford, Middlesex, 1917, COOPER, ex G. C. BROWN. Thellung says, under *H. secalinum* Trinius (*Sp. Gram.* i., 1828, t. 4), planta paullum nota e Sibiria descripta.

†2854 (4). H. TRIFURCATUM Jacq., ex Baillon in Bull. Soc. Bot. Fr. i., 187, 1854. Alien. Glasgow, R. GRIERSON.

2885. ASPLENIUM ADIANTUM-NIGRUM L., var. CAUDIFOLIUM. Found by Mr Druery in 1883 in great abundance on a stretch of stone dyke on Dartmoor. It persists, and was again found in profusion in 1913.

2912. ANAGRAMMA LEPTOPHYLLA Christ. (*Gymnogramma*). R. T. Lynch (*Gard. Chron.* 211, 1921) states that he sowed " a good fat packet of spores," obtained from plants grown at Cambridge, " down the water lane which leads from near St Martin's to the sea . . . the only indiscretion of the kind I ever committed." If it appears there its origin is thus accounted for.

NOTES ON PUBLICATIONS, NEW BOOKS, ETC., 1921.

(*Owing to exigencies of space and the erratic receipt of foreign works this is necessarily incomplete.*)

ALMQUIST, E. Studies of *Capsella Bursa-pastoris*, in Acta Hort. Berg. 45-95, 1921, with figures. See p. 273.

ALMQUIST, S. Roses in the Swedish Herbaria. See p. 278.

ARNOLD ARBORETUM, JOURNAL OF THE. Edited by C. Sprague Sargent. Vol. ii., 1920. Riverside Press, Cambridge (Mass.).

ARTSCHWAGWER, E., Ph.D., and SMILEY, EDWINA. DICTIONARY OF BOTANICAL EQUIVALENTS: French-English and German-English. Williams & Wilkins, Baltimore; 2.25 dols.

BEGUINOT, AUGUSTO. LA BOTANICA. pp. 116. Roma, 1920; 3.50 lire.

BEWS, Prof. J. W. AN INTRODUCTION TO THE FLORA OF NATAL AND ZULULAND. pp. vi., 248. Wheldon & Wesley, London; 15/-.

BLACK'S GARDENING DICTIONARY. Edited by E. T. Ellis, and arranged in alphabetical order. A. & C. Black, 4-6 Soho Square, London, 1921; 15/-.

BLACKBURN, K. B., and HARRISON, J. W. H. The Status of the British Rose Forms, etc., in Annals of Botany, vol. xxxv., 159, 1921.

BLATTER, ETHELBERT S. J., F.L.S. FLORA ARABICA. Pt. ii., Leguminosae to Compositae; pp. 121-282. Rec. Bot. Soc. of India viii., n. 3. Calcutta, 1921.

BOODLE, L. A. Mistletoe on Lime-trees, in Kew Bulletin, n. 5, 212, 1921.

BOSE, G. C. A MANUAL OF INDIAN BOTANY. pp. xvi., 368, tt. 8. Blackie & Son, London, Bombay, and Glasgow; 7/6.

Brenchley, Winifred E. Weeds of Farm Land. pp. 239, tt. 11. Longmans, Green & Co., London, 1920; 12/6. This is a most valuable, useful, and practical work, which should be in the possession of every agriculturist. In 13 chapters the subject is adequately dealt with, and a mass of information placed before the reader in a pleasing guise. In Britain, where there is no such rich endowment of agricultural study as is possessed by the Department of Agriculture at Washington, with its enormous output of literature, we are necessarily much behind in the scientific treatment of farm pests. This work will therefore give a much-needed help to those to whom the undue presence of weeds may materially alter the yearly balance-sheet for the worse. During the war much hasty and wasteful change of land from pasture to arable was insisted on by not too well-informed officials. Had the same amount of energy and expenditure been made in clearing the existing arable from weeds, in hedge-cutting, and in better and more complete ploughing, both the nation and the agriculturist would have been greatly the richer. At the present time, with the ruinous cost of production, farmers are too apt to allow weeds to increase owing to the high price of labour, but he may gather how necessary it is in an economic sense to subdue their number, and may obtain most useful help from Miss Brenchley's book, and will be led to see the importance of clearing his crops of many pernicious pests. Among these are the grass *Alopecurus agrestis* (its old and more correct name is *A. myosuroides*). Chapter 2 treats of the Distribution of Weeds. Many, of course, are brought in the seeds of the various crops; manure brings others; the mud on cart-wheels, as the Rev. A. Woodruffe Peacock has shown, is a responsible agent for the introduction of others (*Juncus tenuis* is thus spread), and storm currents, as Mr Peacock points out, convey seeds and parts of plants for a considerable distance. Many weeds are prolific seeders. Among these may be mentioned *Polygonum aviculare* (this rampaged over the devastated areas of Flanders and France), *Anagallis arvensis*, *Cerastium viscosum*, *Stellaria media*, the Speedwells, *Brassica arvensis* (the authoress uses the less correct name *B. Sinapis*, which does not retain the oldest trivial), the Dodders, Poppies, and Shepherd's Purse. Reference is also made to those plants having specialised seeds for wind or animal dispersion. Birds are themselves agents for the spread of many plants owing to the enormous number of seeds which are eaten by them, a large percentage of which pass uninjured through the alimentary canal. In other cases the creeping roots themselves are apt to break up under agricultural operations, and thus the spread of *Convolvulus arvensis* and *Arrhenatherum tuberosum* (to which only varietal grade is given) is to be accounted for. This year in Shetland a farmer told me he had cleared two tons of the Onion Twitch from a small croft where it abounded. Chapter 3, on the Prevention and Eradication of Weeds, is eminently useful and practical. Thistles, it is said, may be destroyed by three cuttings each year, while a field infested with *Genista tinctoria* had better be converted into arable, as ordinary methods prove useless against this deep-rooted nuisance, which stock refuse to eat. I have—perhaps fortunately—failed to grow it in my garden. Iron sulphate in a 5 per cent. spray proves effectual in destroying Bracken, while lime is most useful in killing the acid-loving *Rumex Acetosella.* In Chapter 4 are quoted the results obtained by a Committee of the British Association in 1857 in testing the vitality of seeds over prolonged periods. Furze germinated when 15 years old, but a much longer period is claimed for its vitality, for 25 years was said to be proved in Cumberland by J. Parkin. At present we are still deficient in the precise knowledge of the vitality of buried seeds. The popular mind is always ready to accept "mummy wheat" and "buried henbane" centuries old, but Miss Brenchley herself gives the results of many carefully-conducted experiments, which greatly extend our knowledge of the age of seed-vitality. Not only birds but animals assist in the distribution of weeds since they are also voracious devourers of seeding plants. A cow was estimated to have eaten during the day 89,000 seeds of Plantain and 564,000 seeds of Camomile, of which 87,000 of the former and 198,000 of the latter passed through uninjured. Fifty per cent. of seeds capable of germination of *Chenopodium album* and *Rumex Acetosella* also were voided by a pig. We have shown in the *Adventitious Flora of Tweedside* how strong, hot solution of caustic soda, and of sulphuric acid did not kill the seeds of Medics or *Chenopodium*, nor do the moist fermenting heaps of manure destroy *Chenopodium album*, *ficifolium*, or *rubrum*, which are often seen in masses on those reeking heaps, and the same, too, is true of *Polygonum Persicaria* (which throughout is mis-spelled *Persecarea*), and Rumices. Chapter 5 is devoted to the Habits of Weeds, and Chapter 6 to Parasites, among which Dodder and Broom-rape are the worst. The careful screening of the seed is strongly recommended—it is better to prevent than cure. Chapter 7 is on Poisonous and Injurious Weeds. Among the former one is surprised to find *Pteridium*, *Brassica arvensis*, *Raphanus Raphanistrum*, *Anagallis*, and the suspected *Nepeta Glechoma*. However, what is one man's meat is another man's poison, since Shepherd's Purse is said to have caused the death of two children who had eaten the tops, and yet it has been grown as a salad in America. Surely the deaths in this case were an instance of idiosyncrasy. Perhaps the so-called poisonous properties of *Equisetum* are caused by mechanical irritation of the mucous membrane due to the rough silicious structure of the plant rather than to any toxic principle, just as the irritation of the lungs by silicious particles in the case of granite and flint workers allows the ready entry of tuberculosis germs. Instances of death of cattle frem eating *E. palustre* have recently occurred in Oxfordshire. Chapters 8 and 9—Arable Weeds and Associations with Soils—are suggestive and helpful. *Arabis Thaliana* (*Sisymbrium Thalianum*) is said to be rare in arable soils in Bedfordshire: it is, however, frequent in light sandy soils in Berks, Bucks, and Oxfordshire. Morison (*Hist. Ox.* ii., 235, 1680) says " provenit in agris frumentaceis humidis passim circa Oxonium," but it is practically absent from the cold clays and chalk. A series of tables are given to show the percentage of frequency of certain weeds in root and other crops, those which are most frequent in cereal and root-crops, and those which seem to shun them. Grass-land weeds are dealt with in Chapter 11, and the Uses of Weeds in Chapter 12, while the Popular and Local Names are given in the concluding chapter. The illustrations are a useful feature. Miss Brenchley is to be heartily congratulated upon this compact and handy publication.

BRITISH ASSOCIATION: Edinburgh Meeting. Presidential Address on The Present Position of the Theory of Descent in Relation to the Early History of Plants. The papers read included one on The Distribution of Certain Elements in the British Flora, by Mr Matthews. Origin of the Moss Rose, Major C. C. Hurst—" Only differs from the old Cabbage Rose in multiple branching of its gland structures." The popular lecture was on Graft Hybrids by Prof. F. E. Weiss. Factors of Evolution, Dr J. P. Lotsy—" The species concept remains an abstraction. Nature consists of individuals; similar individuals form syngameons, and these have been mistaken for species. . . . The only transmissible changes proved to occur are the results of crossing. These changes transgress the limits of Linnean species."

BRITTEN, JAMES. Thomas Walter and his Grass, in Journ. Bot. 69, 1921. The Compendium of Smith's English Flora (and Aeneas MacIntyre), *l.c.*, 176, 1921.

BRITTON, N. LORD, and ROSE, J. N. THE CACTACEAE. Vol. ii., Cereeae, with 40 coloured plates, 305 illust., 4to. The Carnegie Institute of Washington, 1920; £7 10s.

BROWN, N. E. New Plants from Tropical South Africa, collected by Archdeacon F. A. Rogers (the son of our Rubi specialist, the late Rev. W. Moyle Rogers), in Kew Bulletin, n. 8, 289, 1921. Mr Brown has named five species after him.

BROWN, N. E. History of the Cape Aloe (*A. spicata* Thunb.) in Gard. Chron. 6 and 16, 1921. Mr Brown shows that the plant figured in Bentley & Trimen's *Medicinal Plants* as *spicata*, and the plant described by Baker under that name in the *Flora Capensis* vi., 316, is an Abyssinian species which is specifically different from Thunberg's plant.

BROWNE, LADY I. M. P. Anatomy of the Cone and Fertile Stem of *Equisetum*, in Annals of Botany, vol. xxxv., 427, 1921.

BULLEY, A. K. Alpine Plants on Snowdon, in Kew Bulletin, No. 8, 319, 1921. It is to be sincerely hoped that the most reprehensible idea of sowing exotic plants on this or any other British Mountain may not be carried into effect.

BUNZO, HAYATA. BUNZO ICONES PLANTARUM FORMOSONARUM NECNON ET CONTRIBUTIONES AD FLORAM FORMOSANAM. Vol. 10, pp. iv., 335, 1921; with an index to the 10 volumes, in which 170 families, 1197 genera, and 3658 species are described, 1200 species being new.

Burtt-Davy, Joseph. New or Noteworthy South African Plants, in Kew Bulletin, n. 2, 40, 1921.

Carnegie Institute. Classified List of Publications of the Carnegie Institution of Washington. Washington, February 15, 1921.

Chamberlain, C. J. Grouping and Mutation in *Botrychium*. in Bot. Gazette 387, 1920.

Chevalier, Aug. Exploitation Botanique de l'Afrique occidentale francaise. Tome 1, Enumeration des Plantes récoltées; pp. 795. Paris, 1920; 60 fr.

Church, A. H., F.R.S. Elementary Notes on the Systematy of Angiosperms. Bot. Mon., No. xi. Clarendon Press, 1921; 3/6.

Clarke, W. G., F.G.S. Norfolk Topography in the Botanist's Guide of 1805, in Trans. Norf. and Norw. Nat. Soc. xii., pt. 2. 179, 1920-1. An excellent contribution.

Clarke, W. G., F.G.S., and Gurney, R., M.A., F.Z.S. Notes on the Genus *Utricularia* and its Distribution in Norfolk. in Trans. Norf. and Norw. Nat. Soc. xi., pt. 2, 128, 1920-21. See p. 300.

Claussen, J. Studies on the Collective Species of *Viola tricolor* L., with 3 plates, in Botan. Tidsskrift Copenhagen, binds 37, hefte 3, p. 205, 1921.

Clifford, Sir Hugh. Botanic Gardens, Victoria, Nigeria. Address to the Nigerian Council, December 29, 1920. Draws especial attention to the importance of keeping these gardens in a high state of efficiency on account of the service they may be to the Colony.

Cook, Dr M. T. College Botany: Structure, Physiology, and Economics of Plants. pp. x., 392. J. B. Lippincott & Co., Philadelphia & London; 12/6.

CRABTREE, J. H. ROCKS AND FOSSILS AND HOW TO IDENTIFY THEM : a companion volume to Grasses and Rushes, British Ferns, and Woodland Trees. pp. 62, with many plates. The Epworth Press; 1/9.

CURTIS, JOHN WRIGHT (1814-64) : His Herbarium. C. E. Salmon in Gard. Chron. 15, 1921.

DARWIN, FRANCIS. Studies in Phaenology, No. 1920, in New Phytologist 30, 1921. The flowering of 272 species is noted for the four years 1917-1920.

DENSMORE, Prof. HIRAM D. GENERAL BOTANY FOR UNIVERSITIES AND COLLEGES. pp. xii., 459. Ginn & Co., Boston and London, 1920; 12/6.

DENT, Mrs, and THE WILD FLOWER MAGAZINE. The twenty-fifth year of this popular Magazine was felt to be a happy opportunity on the part of its members, under the auspices of Miss A. B. Cobbe, to present its founder, Mrs Dent, with a handsome and artistic silver rose bowl as a testimony of gratitude for her great zeal, and we may add our hearty congratulations upon her very sturdy and vigorous offspring. Mrs Dent has been fortunate to enlist so many willing helpers. Among these are Miss Gertrude Bacon, Lady Davy, Miss Cardew, Mrs Godden, Miss Cobbe. Miss Peck, Mrs Pinckney, Miss Bingham Stevens (Brownie), Miss Honor Penycoste, Miss Lucy Richards, Mrs Sandwith, Mrs Williams, Mr T. H. Green, and Canon Claye. In one year Mr T. H. Green recorded 1026 species out of the 1323 specified. The Commemoration Number contains a paper by Lady Davy on the Holy Thorn at Glastonbury. The Somerset ballad is quoted :—

> "The Staff het budded and het grew
> And at Christmas bloom'd the wholdaroo (wonder),
> And still het blooms at Christmas bright,
> But best tha sey at dark midnight."

Mrs Dent tells of the inception of the Magazine. We offer our best wishes for the continued success of the Magazine and its readers.

DOMIN, Prof. KARL. BEITRAGE ZUR FLORA UND PFLANZEN-

GEOGRAPHIE AUSTRALIENS IN BIBLIOTHECA BOTANICA. Stuttgart, 1921. We are glad to see the issue of our honorary member's important contribution to Australian Botany, of which he showed some portions to us last year at Prag, and we warmly congratulate him on his recovery from a serious operation he has had recently to undergo.

DOWNING, ANDREW J. LANDSCAPE GARDENING. Tenth edition, pp. xv., 439. Chapman & Hall, London; 36/-.

DRUCE, G. CLARIDGE. The Nomenclature of British Ferns, in The British Fern Gazette, pp. 182-190, 1921. Shetland Plants, in Trans. Linn. Soc. 14, 77, 1921. *Matricaria suaveolens* in Britain, in Gard. Chron. Botanical Foreword, in Wild Flower Magazine 2, 145, 1921.

EDINBURGH ROYAL BOTANIC GARDEN, NOTES OF. In vol. xii., n. 60, an interesting account is given of the garden, which was founded in 1680, and now covers 58 acres. Over half-a-million of people visited it last year, and during the past 32 years nearly 20 million visitors have passed through the entrance gate: a fact that may well please Sir I. Bayley Balfour, who may be assured that each of its visitors received pleasure.

ELFORD, P., and HEATON, S. PRACTICAL SCHOOL GARDENING. Second edition, pp. 224. Clarendon Press, Oxford; 3/6.

EVANS, Dr I. B. POLE. THE FLOWERING PLANTS OF SOUTH AFRICA. Vol. i., pp. 11, tt. x.; Pt. ii., tt. 11-20. L. Reeve & Co., London; coloured 15/-, plain 10/-.

FAIRCHILD, DAVID. Inventory of Seeds and Plants Imported by the Office of Foreign Seed and Plant Introduction, July 1 to September 30, 1916. U.S.A. Department of Agriculture, Washington, 1921.

FARRER, REGINALD. Second Exploration in Asia. In the *Gard. Chron.* for 1921 there is an especially interesting series of papers from the pen of our late talented botanical traveller describing in his usual facile and felicitous manner the glories of the Rhododendrons and other alpine plants he met with on his arduous journey.

FRITCH, Prof. F. E., and SALISBURY, Dr E. J. BOTANY FOR STUDENTS OF MEDICINE AND PHARMACY. pp. xiv., 357. G. Bell & Sons, London; 10/6.

FRITCH, Prof. F. E., and SALISBURY, Dr E. J. AN INTRODUCTION TO THE STUDY AND REPRODUCTION OF PLANTS. pp. viii., 458. G. Bell & Sons, London; 15/-.

FURNEAUX, W. S. COUNTRYSIDE RAMBLES. pp. lvi., 186. New Era Library. G. Philip & Son, Ltd., London.

FYSON, Prof. P. F. THE FLORA OF THE NILGIRI AND PULNEY HILL-TOPS. Vol. iii., pp. xvii., 581. Government Press, Madras.

GAMBLE, J. S., F.R.S. FLORA OF THE PRESIDENCY OF MADRAS. Pt. 4, Rubiaceae to Ebenaceae; pp. 579-768. Adlard & Son, West Newman, London, 1921; 10/-. We may take this opportunity of congratulating Mr Gamble on this most useful work and to thank him for identifying the old Indian material in the herbaria of Dubois and Sherard.

GATES, R. R. Study of Pollen Development in *Lactuca*, in Annals of Botany, vol. xxxv., 365, 1921.

GODFERY, Col. M. J. *Epipactis Muelleri*: A new European *Epipactis*, in Journ. Bot. 101, 1921. A new European *Serapias*—*gregaria* Godfery, *l.c.*, 241, 1921, from Hyères, and also *S. Lingua*, var. *anomala*.

GODFERY, Col. M. J. Two New Orchid Hybrids—*Serapias Lingua* × *Anacamptis pyramidalis* and *Ophrys arachnitiformis* × *scolopax*, in Journ. Bot. 57-60, 1921.

GUNTHER, R. T. Goodyer MSS. in Magdalen Coll. Library, in Trans. Linn. Soc. 16, 1921. The occurrence of the Library of Goodyer and of the How's MSS. is mentioned in the preface, p. cvii., of the *Flora of Berkshire* of 1897, and the Goodyer Library and MSS. in the *Rep. B.E.C.* 523, 1916.

HAINES, H. G., C.I.G. BOTANY OF BIHAR AND ORISSA. Pt. ii., pp. 224. Adlard & Son, West Newman, London, 1921; 10 rupees.

HARRISON, J. W. HESLOP. The Genus *Rosa* : its Hybridology and other Genetical Problems, in Trans. Bot. Soc. Northumb., Durham, and Newcastle-on-Tyne v., 244-298, 1921. See p. 279. *Primula farinosa* : its Variation in Co. Durham, in The Vasculum, February 1921, with a new var. *littoralis*. See p. 296.

HARRISON, J. W. HESLOP, and BLACKBURN, K. B. The Status of British Rose Forms as determined by their Cytological Behaviour, in Ann. Bot. 159, 1921.

HEDEREN, B. *Primula veris* in Nordvasta Dalarne, in Svensk Bot. Tidskrift, band 15, p. 269, 1921.

HILL, Capt. A. W. A Visit to the Cameroons and Nigeria, in Kew Bulletin 6, 1921. This was an official visit by the Assistant Director of Kew to report upon the Botanical Gardens in that area and upon their restoration and future maintenance. Capt. Hill also made some collections, among which was a new species of *Ochna* which Mr Hutchinson names *O. Hillii*.

HILL, ARTHUR W., and BEAN, W. J. MEMOIR OF HENRY NICHOLSON ELLACOMBE (1822-1916). The Country Life Library; 10/6. An interesting appreciation of a remarkable horticulturist and a most pleasing man, whose love for plants was proverbial and whose knowledge of them and their culture almost phenomenal.

HORWOOD, A. R. A NEW BRITISH FLORA : British Wild Flowers in their Natural Haunts. Vol. v., pp. xi., 234 ; vol. vi., pp. xix., 232. Gresham Publishing Co., London, 1919 ; 12/6 each vol.

HUGHES, D. K. A Revision of the Australian Species of *Stipa*, in Kew Bulletin 1, 30, 1921. Forty species are mentioned, including several new ones. A Key to the Groups and Species is appended.

HURST, C. P. East Wiltshire Plant Galls, in Wiltshire Arch. and Nat. Hist. Soc. xii., 354. Among them is a new British record of a gall on *Salix triandra* caused by a saw-fly—*Pontamia proxima* Lepel. and another on *Gentiana Amarella* caused by *Eriophrys Kerneri* Nalepa.

HUTCHINSON, J. THE GENERA OF FUMARIACEAE AND THEIR DIS-

TRIBUTION. The author holds that Fumariaceae is a distinct family and accepts 18 genera. He uses the names *Dicentra* and *Corydalis*, which are not the earliest.

HUTCHINSON, J. The Family Winteraceae, in Kew Bulletin, n. 5, 1921. The Literature, Distribution, Economic Products, Description, and Anatomical Features are given, as well as a Key to the Seven Genera which it contains.

HUTCHINSON, J., and PEARCE, K. Revision of the Genus *Tryphostemma*, in Kew Bulletin 7, 257, 1921. Twenty-five species are described or enumerated.

JOHNSTON, Colonel H. H. Notes on the Flora of the Orkney Isles, etc., in Trans. Bot. Soc. Edinburgh, vol. xxvii., pt. I, 43.

JOHANSSON, K. Bidrag till Kannedomen om Gottlands Ulmusformer, in Svensk Bot. Tidskrift, band 15, hafte 1, p. 1, 1921. *U. glabra*, forma *grandidentata*, is figured.

LANGE, AXEL. Lists of Plants from Tun and Hjelm, in Botanisk Tidsskrift Copenhagen, binds 37, hefte 1, p. 1, 1920.

LAUFER, BERTHOLD. SINO-IRANICA : Chinese Contributions to the History of Civilisation in Ancient Iran, with special reference to the History of Cultivated Plants and Products. Field Museum of Nat. Hist. Publications, Anthropological Series. Vol. xv., pp. ix., 445, 1919.

LAUDEGARDH, H. Ecological Studies in the Assimilation of Certain Forest Plants and Shore Plants, in Svensk Bot. Tidskrift, band 15, hafte 1, p. 46, 1921.

LESTER-GARLAND, L. V. Some Plants from Jebel Marra, Darfur, .in Journ. Bot. 46, 1921.

LINDQUIST, HY. Om Vegetationen des pa det europertka Ryssland stepper., in Svensk Bot. Tidskrift, band 15, hafte 1, p. 20, 1921.

LJUNGQVIST, J. E. Ein neuer Fundort. für *Nitella batrachospermum*, in Svensk Bot. Tidskrift, band 15, p. 270, 1921.

LOUDON, J. C., and the Garden Magazine, with an account of the issue of the Arboretum et Fruticetum. See *Gard. Chron.* 216, 1921.

LYNN, M. J., M.Sc. The Reversal of Geotropic Response in the Stem, in New Phyt. 116, 1921.

MACOUM, J. M., and HOLM, T. REPORT OF THE CANADIAN ARCTIC EXPEDITION, 1913-18. pp. 25, tt. 13. F. A. Acland, Ottawa.

MAIDEN, J. H. FOREST FLORA OF NEW SOUTH WALES. Vol. vii. W. A. Gullick, Sydney.

MAGNUSSON, A. H. *Pulsatilla vernalis* L., bei Gothenberg, in Svensk Bot. Tidskrift, band 15, p. 271, 1921.

MARTIN, Prof. J. H. BOTANY WITH AGRICULTURAL APPLICATIONS. Second edition, pp. xii., 604. J. Wiley & Sons, New York: 21/-.

MILLER, CHRISTY, F.L.S. An account in Wistman's Wood of small aged specimens (500 years) of *Quercus pedunculata* at 1500 feet alt. on the steep left bank of the West Dart, almost in the centre of Dartmoor. Proc. Linn. Soc. 9, 1921.

MONCKTON, H. W. On the Distribution of *Taraxacum erythrospermum* Andr. in the South-east of England. in Trans. Linn. Soc. 19, 1921. On the chalk in Surrey a red-fruited form is *T. lacistophyllum.*

OLSEN, CARSTEN. The Ecology of *Urtica dioica*. in Journ. of Ecology, vol. ix., no. 1, p. 1, 1921.

OMANG, S. O. F. *Hieracium*: Forms of the Group *alpina*. in Nyt. Mag. Nat. 69-106, 1919.

ORCHID REVIEW. Under the able editorship of Mr Gurney Wilson, F.L.S., we are glad to see this useful publication continued in an enlarged form. It is now issued at 1/- per month.

OSTENFELD, C. H. CONTRIBUTIONS TO WEST AUSTRALIAN BOTANY. Pt. iii., Additions and Notes to the Flora of Extra-Tropical West Australia: pp. 144. Host & Son, Kobenhavn.

OSTENFELD, C. H. *Hieracium rigidum* and mutants. See p. 293.

PARKER, R. N. North-West Himalayan Astragali of the sub-genus *Aegacantha*, in Kew Bulletin 7, 278, 1921.

PEARSALL, W. H., père et fils. Potamogetons in the English Lakes, in Journ. Bot. 100, 1921. This contains a new sub-sp. *lacustris* = *P. Sturrockii* Ar. Benn. (*Rep. B.E.C.* 841, 1919, but not of the *Scot. Nat.* 28, 1883).

PENNELL, FRANCIS W. *Veronica* in North and South America. Contr. New York Bot. Garden, n. 230, 1921, with key to the genera and sub-genera. Our *hederifolia* is put as the type of the sub-genus *Veronicella* Fabr. Enum., 1765. With it are *V. spicata*, *V. fruticans*, *V. alpina*, *V. serpyllifolia*, and var. *humifusa*, *V. peregrina*, *V. arvensis*, *V. agrestis*, *V. polita*, *V. persica*. True *Veronica* contains *Chamaedrys*, *officinalis*, *Beccabunga*, *Anagallis-aquatica*, and *scutellata*. The sub-genus *Hebe* has no British representative.

PERCIVAL, Prof. JOHN. THE WHEAT PLANT: A Monograph. pp. 455 and figs. Duckworth & Co., London, 1921; 63/-. In this portly volume of 463 pages Professor Percival has compressed the results of his painstaking researches of twenty years. The subject is one of vital importance to the human race, since wheat is grown to a larger extent than any other food produce, and with the exception of Siam in every European and Asiatic country. Indeed, the only parts of the world from which it is absent are hot, low-lying regions of the Tropics! It can be grown far north, well into the Arctic Circle, up to 65 degs. N. on the Mackenzie River and southwards to the Equator, where in Ecuador and Columbia it is found at an elevation of 10,000 feet. In Tibet, Humboldt mentions its presence at as high an elevation as 15,000 feet. The Chinese well regarded it as a gift from heaven, and its lineage is of the lengthiest—well formed grains being found in Neolithic deposits. Wheat originated from two or three wild species, "but through hybridisation, mutation, and the effects of selection and cultivation the races of wheat have become as complex as the human race." Professor Percival has performed well the gigantic task of describing the main forms, of which for some years he has had nearly 2000 in cultivation under his observation at the University College Farm at Reading. Many of these, from excellent original drawings, are illustrated in the 228 plates. It may be well to say that Linnaeus in 1753 described five species of Wheat—*Triticum aestivum, hybernum, turgidum, Spelta*, and *monococcum*, to which in 1763 he added *T. polonicum*, a name propounded by Plukenet, and described in Morison *Hist. Ox.* iii., 175, 1699. Percival thinks it a mutation of *T. durum*. The younger Linnaeus, in 1781, introduced *T. compositum*. a form of *T. turgidum*. In 1821 Roemer and Schultes recognised 21 species. Hackel (Engler & Prantl *Nat. Pfl.* 1887) reduced the cultivated wheats to three species, *monococcum, sativum*, and *polonicum*. Professor Percival says two wild species are known, and the cultivated wheats, none of which are found wild, fall into eleven natural groups. These he calls " races " rather than species. Under *T. aegilopoides* Bal., Wild Small Spelt, is put the race *T. monococcum* L. Under species *T. dicoccoides* Körn are placed the races *T. dicoccum* Schübl (Emmer), one of the oldest of cereals, being found in Neolithic remains, and well carved models of it were found in the tomb of King Zer Ta. 5400 B.C., in Egypt; *T. orientale* Percival (Khorasan Wheat); *T. durum* Desf. (Macaroni Wheat); *T. polonicum* L. (Polish Wheat). first mentioned by Bauhin, 1651, next by Bobart, 1690. who says he had it out of Worcestershire; *T. turgidum* L. (Rivet or Cone Wheat). mentioned in Tusser's Husbandry in 1580, but already mentioned by Fuchs in 1542; *T. pyramidale* Percival (Egyptian Cone Wheat); *T. vulgare* Host (Bread Wheat), also of very early culture, and of hybrid origin; *T. compactum* Host (Club Wheat), grown by Neolithic man; *T. sphaerococcum* Percival (Indian Dwarf Wheat); and *T. Spelta* L. (Large Spelt). The name " spelt " (speltae) occurs in an edict of Diocletian, A.D. 301. The Wheat is said to be of Germanic origin, and Percival suggests that it is a segregate of the hybrid of the Emmer series with *Aegilops cylindrica*. This method of classification may trouble the compilers of an index of species since, as in the instance of the *Kew Index*, " races " are not consistently recognised. But as hybrid names are admitted it would seem desirable to recognise them. and they might have the word " race " following the reference. Britain may well be proud of this monumental work, which will be the text book for Agricultural Science for many years to come. Our profound admiration for the industry and ability displayed in its production cannot be properly expressed in the limited space at our disposal.

PETERSEN, H. E. Studies on *Pimpinella Saxifraga* L., in Botan. Tidsskrift, binds 37, hefte 3, pp. 222, 1921.

PIETERS, J., and KEPHART, I. W. Annual White Sweet Clover (*Melilotus alba*) and Strains of the Biennial Form. U.S. Department of Agriculture, Circular No. 169, Washington, 1921.

POPENHOE, WILSON. MANUAL OF TROPICAL AND SUB-TROPICAL FRUITS. Macmillan & Co., New York; 30/-.

POULTON, ETHEL M. An Unusual Plant of *Cheiranthus Cheiri*, in New Phytologist 242, 1921. But it is not rare.

PRAEGER, R. LLOYD. An Account of the Genus *Sedum* as found in Cultivation, in Journ. Royal Hort. Soc., vol. xlvi.

PRAEGER, R. L. ASPECTS OF PLANT LIFE, WITH SPECIAL REFERENCE TO THE BRITISH FLORA. pp. 208. Nature Lovers' Series. S.P.C.K., London; 6/-.

PRAIN, SIR DAVID. INDEX KEWENSIS: an Enumeration of the Genera and Species of Flowering Plants from the time of Linnaeus to the year 1885. Compiled at the expense of the late Charles Robert Darwin, under the direction of Sir Joseph Hooker, by B. D. Jackson. Two volumes, royal 4to, pp. 2568, morocco back, with one uniform volume of five supplements, bringing the work down to the end of 1915, £25 4s. The volume of supplements separately, £12 12s. The two volumes of the original work with five separate supplements, in cloth, £21. Supplement I. (1886-95), by T. Durand and B. D. Jackson; pp. 526; not sold separately. Supplement II. (1896-1900), compiled at Kew under the direction of Sir W. Thiselton Dyer; pp. 204, 36s net, or in two parts, paper covers, 15s net each. Supplement III. (1901-5), compiled at Kew under the direction of Sir David Prain; pp. 198, 36s net. Supplement IV. (1906-10), compiled at Kew under the direction of Sir David Prain; pp. 256, 36s net. Supplement V. (1911-15), compiled at Kew under the direction of Sir David Prain, pp. 277; Oxford, at the Clarendon Press, June 1921; 76s net. The gratitude of the botanical world is due to the Director and his staff at Kew for the great assistance they have given not only to the scientific side of botany but to the application of the economic side, which has proved of inestimable service to ourselves and to our vast overseas Dominions. In a hundred-and-one ways they are called upon for information, and it is always courteously and readily given, and at no time in its prolonged history, under such great botanists and botanical organisers as Sir John Hill, Sir W. Jackson Hooker, Sir Joseph Hooker, Thiselton Dyer, and Sir W. T. Dyer has this help been more generously bestowed than under Sir David Prain, who has so recently resigned. In the directorship of Sir Joseph Hooker another task was added to Kew. That was the preparation of an Index of Plant Names, which by the far-sighted munificence of Charles Darwin was entrusted to the Director to carry out. Hooker had not far to seek for assistance, for in Dr Daydon Jackson there was a born indexer close at hand. The task was a gigantic one. It was to collate all the generic and specific names given to plants by botanists throughout the world since the year 1753. It must be borne in mind that at its conception the laws which were supposed to govern botanic nomenclature were those promulgated at Paris under the auspices of M. A. de Candolle, in which the starting point of generic citation was the *Genera Plantarum* of Linnaeus of 1737, whereas that of species began with the *Species Plantarum* of 1753, the limitation of genera being based on Bentham and Hooker's *Genera Plantarum*. The one palpable omission in the scheme of citation was the absence of the date of publication in the majority of cases. The preparation of the *Index* not only meant an immense amount of drudgery—there must be 300,000 specific names given—but it also necessitated a great organiser. The publication of the four fasciculi (I. and II. in 1893, III. in 1894, IV. in 1895), paged in two volumes, met with warm encomiums, and its advantages were at once realised by botanists throughout the world. The *Genera Plantarum* being taken as the authority, two grades of type were used—the " official " names for genera in Egyptian as against Roman capitals for the " unofficial " or invalid names, and for species small Roman type for the " official " and italics for the synonyms—and consistent cross-references were given. Thus, *Reseda vulgaris* Mill was correctly referred to the earlier *R. lutea* L., and *Sinapis nigra* L. to the name under the genus *Brassica*, into which Bentham and Hooker merged *Sinapis*, i.e., *Brassica nigra* Boiss. The names are spelled as nearly like the original as possible, that is, the plants of the genus which was established as *Eleocharis* by Robert Brown are put under that name, notwithstanding some purists say it should be as Lindley wrote it, *Heleocharis*, but under the latter the cross-reference is usefully given. So, too, *Brunella* Tourn., which is the more correct name and one which Linnaeus should have used, is referred to *Prunella* L., which is the earliest published *valid* name, even if etymologically incorrect. So, too, *Rynchospora* Vahl of 1806 is adopted because it is the earliest, notwithstanding it should have been written *Rhynchospora* as written by Willdenow in 1809. The two names in the *Index* are separated by 50 pages. It was not unusual at the period when the *Index* was compiled to ignore the works of Sir John Hill, so that, except in a few instances and these not consistently, his names are ignored, and although some editions of Miller's *Dictionary* are cited, others are overlooked, and this even after the starting point of generic and specific citation—1753. On the other hand, some works (notably Adanson's *Familles des Plantes*, which is put on the Index Expurgatorius in the *Cambridge Flora*) are very freely cited, although Adanson did not accept the Linnean system. So, too, is Patrick Browne's *Civil and Nat. Hist. of Jamaica* and Haller's *Historia*, and rightly too, although both are barred in the *Cambridge Flora*. One criticism was not unjustly urged—that the publication of the *Index* gave an opportunity to correct many generic names in the *Genera Plantarum* of Bentham & Hooker, who paid quite secondary attention to matters of nomenclature, and thus were in divergence from continental usage. The publication of the *Index* led to one notable result. A very methodical German who had studied botanical literature in a most searching manner, and who was also a good but not a great systematist—Dr Otto Kuntze—saw that having one date for the citation of genera and another for species brought into the area of citation a considerable number of works published between 1737 and 1753 which according to the laws were not prohibited from adoption. But he went further. He suggested that the starting point for generic citation should be Linnaeus' first systematic work, the rare *Systema Plantarum* of

1735. Taking this date as a standard, he collated the various generic names which had priority over those adopted in the *Index Kewensis*, and in his *Revisio Generum Plantarum* he published the names of very many genera, and under these the species, which if adopted would have made 10,000 (more or less) changes in plant names. Among what most botanists thought was a mound of chaff there was, however, some grain, but Kuntze had been rather arrogant in his statements, had not endeared himself to those with whom he came into controversy, and his suggestions were treated with contumely. About that time, and in the absence of such a work as the *Index Kewensis*, I had with great labour compiled for the *Berkshire Flora* the earliest names I could discover, but to go behind the *Species Plantarum* had never crossed my mind. To avoid this great upheaval in plant names, it seemed the most logical course to make the starting point for generic and specific citation one and the same, i.e., 1753. I therefore wrote at length to M. A. de Candolle urging the desirability of framing a law to that effect. He told me he did not see his way, but when I went more fully into detail, showing its advantages, and when he was independently approached by Prof. Ascherson of Berlin, he gave way, and at the International Botanical Congress in Vienna in 1905, Article 19 says : — " Botanical nomenclature begins with the *Species Plantarum*, ed. i., 1753, for all groups of vascular plants. It is agreed to associate genera, the names of which appear in this work, with the descriptions given of them in the *Genera Plantarum*, ed. v., 1754. In order to avoid undue changes in generic names by the strict application of the rules of nomenclature, and especially of the principle of priority in starting from 1753, the rules provide a set of names which must be retained in all cases." This list was hurriedly prepared, and contains examples of great unfairness. A very important section of American botanists disagreed with the List of Nomina Conservanda as being " in the highest degree arbitrary " and as " controverting a cardinal principle," and they have ignored it. But to return to the *Index*. The first Supplement, including names published 1886-1895, was prepared by Dr Jackson and Theophilus Durand (the author of Durand's *Index to the Genera of Bentham and Hooker*, and joint author with Hans Schinz of the *Conspectus Floræ Africæ*. It was printed at Brussels, and issued in 1906. Unfortunately, under the stress of compilation, Durand nearly lost his eyesight, so that the work is not so free from errors as the original volumes, which had the advantage of the meticulous care which the Clarendon Press gives to its publications. This Supplement had 466 pages, besides over 50 pages of additions and corrections. It thus dealt with over 50,000 names. The same plan of typography is retained, and *Rynchospora*, *Prunella*, and *Eleocharis* are kept as the official names. Most of Kuntze's names are given in synonymy. Hybrids are distinguished by × after the name. In the addenda a hybrid *Brunella* is given without a cross-reference. (This name has another disadvantage: there is already an official *Brunellia.*) The Supplement is printed on an inferior and loaded paper. In 1908 the second Supplement, beautifully printed at the Clarendon Press, was issued, and included the plants published 1896-1900. This consists of 204 pages, and includes nearly 25,000 names. In this the useful reference to the page in the *Index Kewensis* is omitted from the generic name. The three genera already cited as examples are still kept under their original name. Few hybrids are given. The third Supplement, also printed at the Clarendon Press in 1908, deals with years 1901-1905, and was produced under the aegis of Sir D. Prain. In this we find *Rynchospora* and *Rhyncospora* (for instance) are both retained and without cross-reference, as are *Brunella* and *Prunella.* This troublesome factor has to be borne in mind when consulting Supplements III.-V. of the work, or one may miss the reference. Again, very many of the Benthamian genera are split into two or more of Engler's genera. *Ampelopsis*, which was in the *Index* merged in *Vitis*, is now kept in heavy type in accordance with Planchon's monograph. It had been found that the number of addenda to be consulted—one in the original *Index*, two in Supplement I., and one in Supplement II.—led to names sometimes being overlooked. Separate addenda were accordingly discontinued from the third Supplement onwards, any additions being incorporated with the general body of names in one alphabetical arrangement. Hybrids have the word " hybr." after the name. The fourth Supplement appeared in 1913, and gives the names published in the years 1906-1910. A modification is introduced in keeping all the names in one type, i.e., no differentiation between official and unofficial. Owing to the lapse of time since the publication of Bentham and Hooker's *Genera Plantarum*, the generic limits recognised in that work were in numerous cases no longer accepted by a large proportion of systematists. Engler and Prantl's *Die Natürlichen Pflanzenfamilien* could not be taken as a substitute, since the want of uniformity in the treatment of different families precluded its adoption as a standard for genera. As an example, Prantl's "lumping" in *Ranunculaceae* may be compared with Raimann's "splitting" in *Onagraceae*. In the circumstances it was decided that the *Index*—from the fourth Supplement onwards—should no longer be a nomenclator, but should become an Index in the strict sense of the word. Reductions were discontinued, a colon being used to separate two synonymous names, as the employment of the = sign might have led to misconception. Thenceforward the onus of determining the validity or otherwise of a particular name was transferred to the individual systematist. From the fourth Supplement onwards the dates of publication of names have been given in all cases. This has materially increased the utility of the work. Now to come to the volume which is just issued in 1921 under the aegis of Sir David Prain. This, too, is excellently printed by the Clarendon Press, is singularly free from misprints, and is a volume which, treating as it does of the years 1911-1915, had to be prepared during the period of the Great War, with a depleted staff, and amid a thousand interruptions. It includes between 25,000 and 30,000 names. In this, as in the last Supplement, only one kind of type is used for the specific names, and the departure from the plan originally adopted of keeping to the Benthamian and Hookerian standard of genera is still maintained. With the object of rendering the work still more useful, the geographical distribution of the new species was given in greater detail. Many names omitted from previous Supplements were taken up, notably in the genera *Rubus* and *Hieracium*.

Rayner, J. F., F.R.H.S. The Flora of Millbrook Station (S. Hants). Our member found in an area of about 3½ acres 280 species, several of which are additional adventives to the Flora of South Hampshire. Most of the critical plants passed under my observation. The useful list is published in the *Proceedings of the Hampshire Field Club*, vol. ix., pt. 1, pp. 99, 1920.

Rea, Margaret W., B.Sc. Stomata and Hydathodes in *Cam-*

panula rotundifolia and their Relation to Environment, in New Phyt. 56, 1921.

Reid, C., and Groves, J. The Charophta of the Headon Beds of Hordle Cliffs, in Quart. Journ. Geol. Soc., vol. 88, 175-92, 1921.

Ridley, H. N. Indo-Malayan Species of Jussiaea, in Journ. Bot. 257, 1921.

Rock, Prof. Joseph. The Leguminous Plants of Hawaii. tt. 92. Honolulu, 1920.

Russell, Edward J., D.Sc., F.R.S. Soil Conditions and Plant Growth. pp. viii., 406. Fourth edition. Longmans, Green & Co., London, 1921. The first chapter traces the gradual development of the science in history. In the second, which is mainly physical, a very clear account of the soil conditions affecting plant growth is given. "The Biological Condition in the Soil" occupies chapter vi. A long chapter (vii.) is devoted to the micro-organism population, but perhaps the most interesting chapter to botanists is the eighth, which considers "The Soil in Relation to Plant Growth," and contains a concise account of Ecology. Different ecological conditions are discussed and the history and successive changes in the Flora of certain types of soil are traced, while the progressive development of Agriculture is referred to. The last chapter (ix.) deals with methods of soil analysis. A "selected bibliography" of 323 titles of works which are referred to in the text is included. The author explains in the preface that the book is intended as a general monograph, embracing all the branches of the science, including Biology, to be taken in conjunction with a series of special monographs each written by the heads of the various departments of his Experiment Station at Rothamsted, which together will be known as the "Rothamsted Monographs of Agricultural Science." The photographic illustrations are not numerous but are excellently produced. Altogether it is a masterly treatise which cannot fail to awake the interest of botanists, and will be of special value in promoting a closer touch between Biologists, Chemists, and Physicists, which is so very necessary in attacking the complex problems of the soil. C. V. Marquand.

The great part of this exhaustive Monograph is highly technical and, of course, outside the limit of the taxonomist, but no scientific agriculturist can afford to neglect it, and even the field-botanist will meet in its pages with many interesting factors of plant or weed occurrence. For instance, in treating of loam soils, it is correctly stated that *Clematis Vitalba* will wander from the chalk on to loam when these soils abut, but the demarcation is much more abrupt when the chalk abuts on a sand or clay, to which the *Clematis* scarcely extends. In Bucks, where clay has limestone nodules in it, the *Clematis* and *Cirsium eriophorum* may sometimes be found on what at first seems to be a wrong surface soil. Field botanists have long recognised that some plants are fond of acid, others of chalk or calcareous soils, but Dr Russell does well to draw attention to the fact that these partialities are not quite so simple as at first they seem. "A plant may be eliminated from the natural flora not because it cannot tolerate the degree of sourness in the soil but because it tolerates this sourness less well than its competitors. Another plant may flourish in sour soil, not because conditions of sourness are suitable to it, but because of the absence of effective competition. Thus, sorrel is often described as an indicator of sourness, but this is not entirely correct: it is not the presence of sorrel that is symptomatic, for sorrel will grow quite well on chalk soils; it is rather the presence of sorrel, sweet vernal grass, etc., combined with absence of clover. The effect of sourness, like that of any other adverse factor, is to alter the balance in competition somewhat against a particular set of plants, which tend, therefore, to be eliminated in time." In Ireland, on the carboniferous area of the Burren, *Calluna* grows (it is true, in a poor state) almost directly upon the calcareous soil, a curious ecological problem. Dr Russell observes that plants growing on clay soils tend to have larger leaves and to make shorter-jointed growth than plants on sandy soils. The book is a work of which Rothamsted may well be proud.

Salisbury, E. J., and Tansley, A. G. The Durmast Oak-woods, etc., in Journ of Ecology, vol. ix., no. 1, p. 19, 1921.

Samuelsson, G. Om några *Lepidium-arter*, in Svensk Bot. Tidskrift, band 15, hafte 1, p. 29, 1921.

Schinz & Thellung. Beitrage zur Kenntnis der Afrikanischen Flora: Amarantaceae-Compositae, in Naturf. Ges. Zurich 66, 221, 1921. Beitr. zur Kenntnis der Schweizerflora (xviii.): Nomenclature (vii.), *l.c.*, 257-317, 1921.

Skene, Macgregor, D.Sc. Common Plants. 8vo, pp. 271, tt. 24. A. Melrose; 6/-. It is with much pleasure that we call the attention of our readers to this very excellent little book, in which the author has produced the most happy combination between the scientific manual and the popular treatise. Indeed, it is not too much to say that it should be in the hands of every field botanist; even the most experienced will find something in it to interest and instruct him. The book is also well illustrated with some excellent drawings and photographs. The first two chapters and the last deal with the origin and cultivation of races of cereals, particularly of wheat, of which what is probably the original parent plant, *Triticum Hermonis*, has lately been discovered in Palestine. Chapter IV., taking the maple as an illustration, treats of the process of photosynthesis, and the assimilation of the chemical elements necessary to the growth of plants. Then follows an account of the life history and development of various degrees of parasitic plants, the mistletoe, dodders, and broom-rapes, the carnivorous and climbing plants, and of the leguminous plants which are able to extract and retain nitrogen from the air. The various kinds of cryptogamic flora, mildews, rusts, toadstools, lichens, and ferns are all dealt with at length. The chapters on fertilisation are of special interest. Though we cannot in this country exhibit the wonders of the yucca and the fig, the observant field worker will find much to interest him in studying the ways of broom, whin, sage, and many other plants. But perhaps the most interesting chapter in the book is that dealing with graft-hybrids, where it relates how a composite plant from seeds produced from flowers arising from a piece of garden nightshade grafted on to the stock of a tomato, which produced buds at the point of junction of the two plants. The account of the species of ants that grow their own mushrooms should also be noted. T. Gambier-Parry.

Small, Professor James. Some Chapters in Modern Botany, in Proc. Belfast Nat. Hist. and Phil. Soc. 85, 1920-1. (1) The Wanderings of the Groundsel. A most interesting lecture, which we hope sometime to reprint in our Report. (2) The Erectness of Plants.

SMALL, Prof. J. TEXT-BOOK FOR MEDICAL AND PHARMACEUTICAL STUDENTS. pp. 681, fig. 1350. J. A. Churchill, London, 1921; 25/-. To one like myself, brought up on Bentley's Botany, the change to that of Reynolds Green was considerable, but this text-book of Prof. Small's, which is meant to supersede the latter work, is indeed a lengthy journey. There is no doubt of the excellence of this manual, which is intended as a text-book primarily for the medical and pharmaceutical student. For this latter class of student, studying for the qualifying examination, the important part covered in the curriculum is printed in larger type, a smaller type being employed for the more extended syllabus of the major examination and for the groups of lower plants which are usually included in a medical course. Many medicinal and economic plants are used as examples. One of the features of the work is that there is no division of the study of plants into morphology, anatomy, and physiology, and the stages (quoting from the Introduction) have been taken from the seed to the fruit in the order in which they occur in nature. Physiological processes and anatomical or morphological features are discussed at the points where they become dominant in the life of the plant, while certain special aspects, such as movement, evolution, and ecology, are considered towards the end of Part I. In Part II. the Principles of Classification are tersely but clearly described. The Appendix No. I. gives the Diagnostic Characters of certain Medicinal or Poisonous Plants, which is of general interest. The book is well printed, and the very numerous figures are clear and well selected. A good-natured gibe at the insufficiency of a botanical dictionary is given in quoting its definition of a seed as "a ripened ovule," and an ovule is said to be "an immature seed." Dr Small, however, makes it quite clear and attractive by defining a seed as a "ripened integumented megasporangium," which recalls the appellation (a parallelopipedon) given by Sydney Smith to the fishwife, for even laboratory botanists do not like to call a spade a spade, and rarely use one syllable if it is possible to employ four. To the special class of student it is specially written for, and to even a wider range of enquirers, the text-book can be cordially recommended, and its author, who has shown he is not only a good laboratory botanist, but also a philosophical botanist, is to be warmly congratulated upon producing such an excellent piece of work, which is destined to have a wide circulation.

SMALL, Prof. JAMES. The Hydrion Differentiation Theory of Geotropism, in New Phyt. 73, 1921.

SPRAGUE, T. A. A Revision of the Genus *Belotia*, in Kew Bulletin, n. 7, 270, 1921. A Revision of the Genus *Capraria*, *l.c.*, n. 5. The Generic Name *Schizonotus*, in *Journ. Bot.* 249, 1921.

SPRAGUE, T. A., and RILEY, L. A. M. Notes on *Raimannia* and Allied Genera, in Kew Bulletin, n. 5, 198, 1921.

STANDLEY, P. C. FLORA OF GLACIER, NATIONAL PARK, MONTANA. Vol. 22, pt. 5. Smithsonian Institute. Government Printing Works, Washington.

STANSFIELD, F.W., M.D. THE BRITISH FERN GAZETTE. Vol. 4, 1921. We are very glad to see this useful periodical again in evidence under the able editorship of the well-known fern expert.

STAPF, O. Kikuyu Grass, *Pennisetum clandestinum*, in Kew Bulletin, n. 2, p. 85.

STEPHENSON, Rev. T., D.D., and T. A., M.Sc. NATURAL HYBRID ORCHIDS FROM ARRAN. Photographs and description of *Gymnadenia Conopsea* and *Orchis ericetorum*. The suggested parentage seems quite reasonable. In the *Rep. B.E.C.* 199, 1906, I recorded this hybrid from Langton Lees, Berwickshire, and then named it × *O. Evansii*, after my companion, who has not only done so much good work at Ornithology, but also in Botany, the second volume of Fryer's Pondweeds being edited by him. According to British nomenclature, the combination is *Orchis maculata* L. × *Habenaria Gymnadenia*. Messrs Stephenson give a new hybrid from the same Scottish island—*G. conopsea* × *Orchis purpurella*. They also found what they regarded as *O. purpurella* × *latifolia*, *O. purpurella* × *Fuchsii*, and *O. purpurella* × *ericetorum*.

STERNER, R. Om *Geum hispidum* Fr., in Svensk Bot. Tidskrift, band 15, hafte 1, p. 126, 1921.

STONE, HERBERT. A TEXT-BOOK OF WOOD. pp. 240, tt. 41. W. Rider & Sons, London, 1921; 21/-.

STURTEVANT, A. H. NORTH AMERICAN SPECIES OF DROSOPHILA. pp. iv., 150, tt. 3. The Carnegie Institute of Washington Publications, 301, 1921.

TENGWALL, T. A. *Carex rufina* Drej. and *Triglochin maritimum* L. in Torne Lappmask, in Svensk Bot. Tidskrift, band 15, p. 268, 1921.

THATCHER, Dr R. W. THE CHEMISTRY OF PLANT LIFE. pp. xvi., 268. M'Graw-Hill Book Co., New York and London; 18/-.

THELLUNG, A. Pflanzenwanderungen unter dem Einflus des Menschen, in Engler's Bot. Jahrb., band 53, heft 3-5, beib. 116, pp. 37-64, 1915. A fascinating and thorough piece of work of which, one regrets, the exigencies of space prevent a translation being given in full. Dr Thellung refers to the various ways in which the different industries are responsible for plant introduction, referring to wool-washing, ship-ballast, transport by railways, canals. Of 769 adventive species, the wool-industry is responsible for the introduction of 526.

THORRINGTON, F. W. British Fern Varieties, in Proc. South London Entom. & Nat. Hist. Soc., 1919. On p. 13 the writer alludes among others to *Filix-mas*, var. *cristata*, from St Austell, Cornwall.

TROUP, Prof. R. S. THE SYLVICULTURE OF INDIAN TREES. In 3 vols. :—Vol. i., Dilleniaceae to Papilionaceae, pp. lviii., 336; vol. ii., Cesalpinieae to Verbenaceae, pp. xi., 337 to 783; vol. iii., Lauraceae to Coniferae, pp. xii., 783-1195. Clarendon Press, Oxford; £5 5/-.

TURRILL, W. B. A New European Plant, *Gonocytisus angulatus* Spach, found by C. G. Field Marsham on the steep cliffs of Cape Hellas, Gallipoli. It is the *Spartium angulatum* of Sibth. *Flora Graeca*, t. 672.

TUTTLE, GWYNETH M. Reserve Food Materials in Vegetative Tissues, in Bot. Gazette 6, 1921.

UDALE, JAMES. HANDY BOOK OF PRUNING, GRAFTING, AND BUDDING. Simpkin, Marshall, Hamilton, Kent & Co.; 2/6.

WARD, Capt. F. KINGDON. IN FARTHEST BURMA. pp. 311. Seeley, Service & Co., London, 1921; 25/-.

WARD, Capt. F. KINGDON. Botanical Exploration of the North-East Frontier, in the Gard. Chron. for 1921. There are several most delightful papers describing the country covered, and the rare and beautiful plants the intrepid traveller noted.

WEBSTER, A. D. On the British "Brown Oak" Timber, in Gard. Chron. 164, 1921. The best in Britain is said to be that obtained from Rockingham Forest, Ampthill, Beds, and Welbeck, in Notts. This Brown or Red Oak timber is by some authorities thought to be a distinct variety, by others it is thought to be due to the presence of iron in the soil, and by others to the presence of a fungus living in the wood. Mr Webster, however, believes that the presence of iron is the more likely explanation. He says that in America it is much prized. The dining-room at Washington White House is entirely panelled with it. Veneers, as many as thirty or forty to the inch, are used.

WESTBERG, H. *Carex sylvatica* in Dalarne, in Svensk Bot. Tidskrift, band 15, p. 269, 1921.

WILLIAMS, F. N. Critical Notes on Some Species of *Cerastium*, in Journ. Bot. 324, 349, 1921.

WILSON, E. H., and REHDER, ALFRED. A MONOGRAPH OF AZALEAS. Publications of Arnold Arboretum. Cambridge, Mass.; 5 dollars.

OBITUARIES.

Bucknall, Cedric. Born at Bath in 1849; died suddenly at Clifton, Bristol, on December 12, 1921, aged 72. He made music his profession, and settled eventually at Clifton, where he taught. He was organist at All Saints' Church from 1876 to the end, being held in high esteem by the clergy and congregation for himself, his fluency of improvisation, and his skill in plain-song accompaniment. He took his degree of Bachelor of Music at Keble College, Oxford, in 1877, and held the post of Lecturer on Harmony and Counterpoint at the British University. Science, however, was an attraction to him from the first, and he studied continuously different branches of it. As he rarely talked of his knowledge his friends lost sight of his attainments, and others did not realise his wide abilities. Amongst the branches he worked upon may be reckoned astronomy, clock construction, and microscopy. Natural History was his main love, and in this he was ever interested, and never satisfied till he had tried to clear up the difficulties before him. He early joined the Bristol Naturalists' Society, and he began in 1878 to contribute to its *Proceedings* "A List of Fungi of the Bristol District," a valuable summary of fifteen years' diligent search. He recorded 1431 species, amongst which were 76 new to Britain or to Science, and 2 were named in his honour, *Agaricus Bucknalli* (B. & Br.) and *Hemiarcyria Bucknalli* (Massee). Other papers by him on various subjects will be found in the same publications. He was one of the founders of the University Botanical Club for systematic and field botany, and by his constant attendance and frequent papers was a stimulus to the rising generation of botanists. The Botanical Exchange Club has also lost a valued referee. His acknowledged keenness in the field enabled him to detect *Stachys alpina*, new to Britain, growing amongst *S. sylvatica* at Wotton-under-Edge, Glos., as well as a *Rubus* in the same locality, which was named after him by his friend, J. W. White. Later in life he found he wanted a wider field in which to study flowering plants, and this led him often to spend his limited holidays on the Continent for travel in Norway, the Western Mediterranean, the Balearic Islands, and the Pyrenees. His methodical habits were well exemplified in the way he planned out in advance each day's work for these botanical journeys, which gave excellent results, besides securing other unexpected rarities. A large Continental herbarium was in this way formed, which it is hoped may be acquired by the Bristol University. He learnt the languages of the countries he visited, and had a workable knowledge of nine, which helped him when he examined foreign herbaria to study critical genera. He rarely published much of his research, but his monograph, "A Revision of the Genus *Symphytum* Tourn." was accepted by the Linnean Society for its *Journal*, 1913, and another on "British Euphrasiae" was issued as a Supplement to the *Journal of Botany*, 1917. Cedric Bucknall was of a retiring disposition, not seeking honours or notoriety for his work, but believing in knowledge for its own sake. He never spared himself in travel or hours of study in earnest effort to get his critical opinions correct with Nature's laws. Willing to help at all times when appealed to, he endeared himself to those who penetrated his quiet thoughtfulness, and he is mourned for as a friend and a good critical botanist. IDA M. ROPER.

CZAPLICKA, Miss. Died on May 20, 1921. In 1914-15 she made an adventurous journey into the Yenisei and Lena Valleys, which are described in *My Siberian Year*. At Oxford she lectured on Ethnology until the end of the war, and then at the University of Bristol acted in the same capacity. She made in Siberia a small collection of plants which are now in the Fielding Herbarium and await precise identification.

DRUMMOND, JAMES RAMSAY, B.A.(Oxon), F.L.S., the son of a Scottish country clergyman, and grandson of the famous botanical collector, Thomas Drummond, was born on May 25, 1851. Educated at the Edinburgh Academy, and at the Universities of Glasgow and Oxford, he entered the Indian Civil Service in 1874. Posted to the Punjab, he served in that province as Assistant Commissioner, District Judge, and Deputy Commissioner until 1904. Inheriting the natural history tastes of his grandfather (also manifested equally strongly in his granduncle, James Drummond), J. R. Drummond, during his long service in the Punjab, found extensive and valuable collections, largely made by himself but supplemented by others made by native collectors in his private service. The last months of his services in India were spent at Calcutta, his services being lent to the Government of Bengal as Acting Curator of the Herbarium in the Royal Botanic Garden there. It was Drummond's ambition to prepare after retirement a local flora of the Punjab, a proposal to which the Secretary of State for India lent his warm approval. With this object in view he settled after retirement first at Kew and thereafter at Acton. Unfortunately, failing health prevented the realisation of his purpose. He died at Acton on April 11, 1921. D. PRAIN.

DUCIE, THE EARL OF. Born June 26, 1827; died 1921. At Tortworth Court, Gloucestershire, Lord Ducie had an extremely fine collection of trees, in which he took the keenest interest. He had the finest specimen of *Castanopsis californica* in Britain, over 30 feet high, and as it was fertile the seeds of this Golden Chestnut of California were freely distributed to his friends. His collection of Oaks was remarkable. Tortworth is the home of the celebrated *Castanea sativa*, the oldest and largest Sweet Chestnut in Britain. It may be remembered that in our last year's *Report* a short memoir appeared of our late member, Lord Moreton, the only son of Lord Ducie, who was the father of the House of Lords, and a generous patron of the science of arboriculture, of which he was such a splendid exponent. With respect to the Tortworth Chestnut, it is stated that it stood there in 1150, and was then called the Great Chestnut of Tortworth. It fixes the boundary of the Manor. In 1759, at the height of 6 feet from the ground, it had a girth of 46½ feet. See *Gent. Mag.*, 1766.

HARLEY, DR JOHN. Born 1833; died December 9, 1921. By the death of Dr John Harley, a native of Ludlow, the Linnean Society loses one of its oldest members. He was elected on June 18, 1863, and the volume of the Society's Transactions (XXIV.) of the same year contains a paper by him on the parasitism of the Mistletoe, which he studied in the hope of finding some light on the causes of malignant growths in the human subject. In this Dr Harley gives a detailed description of the anatomy of the parasite, the portion of the host to which it is attached, and demonstrates the very close relation existing between the host and parasite. From an examination of the structure of the wood of the various hosts he concluded that the size and number of the medullary rays is the chief cause which determines in any given case the attachment of the Mistletoe. Dr Harley's researches into the action of hemlock attracted attention in the medical world. He wrote papers on "The Old Vegetable Narcotics," besides many on medical subjects which appeared in the Medical and Chirurgical Soc. Transactions. Dr Harley was equally well known for his researches in Geology, and he was a man of wide literary and scientific interests. On retiring from his London practice he built a house, Beechings, near Pulborough, Sussex, on the site of an old British camp, which dominates the surrounding country. Here his botanical knowledge gave him pleasure in experimenting in the culture of rare plants, which he enjoyed showing to his scientific friends. He enjoyed remarkable vigour of mind and body to within a few days of his death on December 9th, at the age of 88.

LEES, FREDERICK ARNOLD. Born in 1853; died at Meanwood, Leeds, September 17, 1921. Lees was the son of F. R. Lees, Ph.D., who wrote a prize essay on "Total Abstinence," which had a very large circulation, and was also an extremely eloquent platform orator, who stood as a candidate in the Total Abstinence interest for Northampton about 1870, but was defeated by a large majority. Arnold Lees entered the medical profession, qualifying as a Member of the Royal College of Surgeons in 1871. He began his practice of medicine in the Yorkshire Dales, and there also he carried on his botanical work with zeal. For many years he had the wandering spirit. He took a practice and soon sold it, and probably his desire to see a new area and make new records was a powerful temptation, which he did not seriously resist. His main work was, however, done in Yorkshire, and in conjunction with Mr J. W. Davis, once Mayor of Halifax, he published an important work on *West Yorkshire*: being an account of its Geology, Physical Geography, Climatology, and Botany, a volume of 414 pages, in 1878, which was so much appreciated that a second edition had to be supplied. In August of that year he was at Market Rasen, in Lincolnshire, a county in the botany of which he took a great interest, and in the same year he took over from Mr Bates Blow the Recordership of the Botanical Locality Record Club, a very useful Society which was started in 1873, whose chief work was to ascertain Plant Distribution in Britain, and to fill up the gaps in the British Watsonian Vice-counties. Lees acted as editor till 1886, and Mr Charles Bailey as its secretary and treasurer, which proved an expensive office. Our own Society has taken up the main scheme of its work in its "New County and other Records." When he was Recorder in 1879 I made Lees' acquaintance, and a botanical correspondence was carried on with him which only ceased with his death. He was a writer of a vigorous style, which in later days became ultra-Carlylean. He was also a good letter writer, always having some problem which he wanted to solve, an identification which he needed, or some theory to expound. One letter picked at random is appended. By the end of 1879 he was at Wetherby, near Leeds, and in 1880 he found and sent me a Sedge which he named (*Science Gossip* 278, 1880) *Carex saxumbra*. He was annoyed to find that it was afterwards (*Journ. Bot.* 97, t. 218, 1881) named *C. pilulifera*, var. *Leesii*. Subsequently it has been identified with the earlier named var. *longibracteata* Lange, and so sinks in synonymy. In May of that year he asks for "specimens of *Oenanthe silaifolia* and *Lachenalii*. Prof. Babington has his doubts about even the Oxford plant being Bieberstein's *silaifolia*, and Nyman does not give Britain for that species at all. He makes out we have *peucedanifolia* Poll. The thing wants working up, and only with fresh specimens and Reichenbach can I do it." By December 1881 he had moved to Warrington, and from that area he made several additions to the West Lancashire flora. From July to October 1883 he was at Reading, Berks, where we made an expedition or two, and from that neighbourhood he sent me a few records which are incorporated in the County Floras. In 1883 he was at Kidderminster, and he says he "hopes to explore the Wyre Forest botany for a year or two," and begs me to obtain for him the recently-discovered *Lycopodium complanatum* from Gloucestershire, but by November he had moved to Staplehurst, Kent, and says "his orbit is as erratic as a comet's." February 1884 saw him again resident in Yorkshire, at Hawes, where "he is getting settled." He says that William Whitwell (whose obituary is in this *Report*) has some Oxfordshire records for me, including *Salsola Kali*, an alien. He wishes God-speed to the forthcoming Oxford Flora. In March I delighted him by sending him *Daphne Mezereum*, which I had just found in Penley Wood (now in Bucks) with Raoul de Seigneux. In June he presses me to work the Lake District and go to his old Lincolnshire district to see his friend's (the Rev. W. Fowler) great find of *Selinum Carvifolia*. In December he writes that he " is busy with the *Flora of West Yorkshire*, towards which the Yorks. Nat. Union made a grant of £25." In 1887 he was at Heckmondwike, and says the compilation of his Flora has made him neglect all else almost. He thinks the long-rayed form of *Pulicaria dysenterica* (described by me in *Midl. Nat.* as var *longiradiata*) may be a distinct species. In 1888 the portly volume of the *Flora of West Yorkshire* appeared under the aegis of the Yorkshire Naturalists' Union, and he well deserved the high commendations passed on it. For a long time it will stand in the front rank of County Floras. Although it brought " no grist to the mill," he must have felt satisfied with the encomiums passed on it by those best qualified to judge. In 1898 he tells me all the *Helleborus viridis* in Yorks is *occidentalis*. He writes in 1902 asking for a reprint of the Dymchurch flora, which he says " all goes to aid the theory I am slowly developing of a natural change in the vegetation of all districts, slowest, of course, where the conditions change the slowest." In 1908 he tells me the *Supplement to the Yorkshire Flora* is complete, and he was keenly interested in the alien species which appear on and about the refuse from the skin-works at Meanwood. In 1909 he accompanied me to Upper Wharfedale to see *Cypripedium Calceolus*, of which we found several clumps, and I was fortunate enough to see one in flower. There we made the acquaintance of Mr Crowther, who showed us a perplexing growth of *Helleborine*, one of which (a hybrid) I named after him. In White's *History of Lincolnshire* in 1892 Lees contributed an article on the Botany and Outline Flora of that county, which was a useful contribution to the Lincolnshire flora. In after years he re-married and settled at Meanwood, Leeds. He sold his herbarium of about 25,000 sheets to the Bradford Corporation, where it is now in the Cartwright Hall, Lister Park, and his books are in the Bradford Reference Library. He retained his love of botany to the last. He was a frequent contributor to the *Naturalist*, not only in prose but verse; but his chief poetic effusions appeared in the *Yorkshire Weekly Post*. On September 17 last year I went to Leeds in order to be shown by its discoverer (Mr R. W. Butcher) the new British species, *Tillaea aquatica*, which grew in the place where Lees had himself gathered *Limosella*. On the following Sunday I called on my old correspondent, who had been ailing, and to my grief found that he had died the day before. As will have been gathered, F. A. Lees was an energetic worker and an original thinker. It is to be regretted that he died before seeing his Supplement *The Vegetation of Yorkshire* through the press, but it is to be hoped that it will not be allowed to lapse. He was elected an Honorary Member of the Yorkshire Naturalists' Union in recognition of his services to science, and he was one of our three Corresponding Members, who are specially selected for their work at British Botany.

He left behind also an unpublished *Flora of Upper Wharfedale* in the hands of his close friend, Mr Joseph Fry Pickard, who wishes to add a few words to his memory:—"I have known him for about twenty-five years, and my association with him has been most intimate. His keen interest and love for the study of Botany never wavered, and up to his last illness he always had some new thought to expound or some original suggestion to make. Not only was his devotion to Botany intense, but he had a profound knowledge of words and dialects. But he never allowed these matters to interfere with his duty towards his medical work. It was a pleasure to see the interest he showed towards young beginners in Botany, and he made many friends with these awakening minds. He was of a somewhat shy disposition until he knew his man, then the real qualities manifested themselves, and his company was delightful. His wondrous collection of newspaper cuttings, illustrated and formed into booklets, dealing with a great variety of subjects to which notes of his own were added, was almost unique. Everything was indexed, and often catalogued. His method in detail was of the highest order. I cannot close without a sincere word of appreciation of Dr Lees' painstaking endeavours in the cause of science. We have lost a brilliant botanist, and we shall miss his original penmanship."

Meanwood. 24/11/1917.

Dear Druce.—Your sending me sample pages 5 and 6 of Alien Tweedsiders was welcome! (sincere thanks), and I wish now that

I had not, the day or two before, sent to the *Naturalist* for the December number my tentative account of the Alien Heron-bills of our waste-lands and arable fields here, though I did describe (after my own fashion) *Erodium Botrys* Bert. among the rest, including *E. cygnorum*, for the transmitted description of which I acknowledge your kindness. However, you'll see the article, I believe, through Sheppard, and, however you may smile at my commentary, will forgive. I burn to see the Tweedside thing, which, no doubt, will be full of applications to the aliens of our skin-yards and wool-wash out-throws. No doubt you are right, alpha to omega, about the " confused " sources of these strange flower faces : I've long noticed that " near east " and Mediterranean coastal things come to us directly from the Cape or Argentine; and your explanation is no doubt equally correct. I'm a good deal " up a tree " in naming the Chenopods called " Fat-Heans " (succulent poor things) hereabout, and the Docks, for we have one Australian and another New Zealand or Argentine form. Some are not allowed long enough on their " limits " to produce good seed, not being so early in maturing as *Erodium* or *Brassica*. I am delighted with the 1916 *Report*. It is magnificent reading—to me, though my son (who is no botanist) says it is like North's Sheep-head—" fine confused fare." The Goodyer account is fine, and the Plant Notes, pp. 397-434, more interesting and illuminative (to me) than anything you've yet done. Hazlitt once, in an essay, said about walking alone and observing :—" Isn't the wild rose sweet without any comment? " Yes, but your comments on *Aquilegia alpina* in Caenlochan Glen, *Scorozonera* in Dorset, &c., make the facts orient and golden. The *Anthriscus* pages of botanic pabulum, too, rejoiced me, and I can confirm much of what you say, both as to that and *Apium repens*. I will try and find you one or two selected examples of the last. But you will have seen what Col. Rawson said the other day *re* the influence of sunlight at certain times and in certain aspects upon the colour of flowers, and I note without surprise, as a thing " of course," G. West's assertion *re* the effect of growing energy exerted under water in case of root-drowned *Tussilago* : the anatomical structure of the rhizome and petiole is totally altered, becomes scalariform, &c., just as with the tiered root-crowns of the wet-ditch grown *Valeriana sambucifolia*. Yet that is just the same entity as *V.*

Mikanii (*officinalis*). In some places where a rocky limestone-soiled wood sheer slopes down to a slowish stream you can see in the ecads every gradation from one to the other. . . . This year, bitten in right hand by a dog in May, I've done little or no sampling, and I have no records save of a few aliens, which records convey nothing but the bare fact of chance. I've noted the big inodorous *Erodium moschatum* (Muscovy, not musky), Stork's-bill, in plenty, and found only one slight staminal difference from the scented type: and also the non-perfumed Mignonette, and have had it sent, too, from Calderside, Ravensthorpe. But a gardener here tells me that he has long noticed that now and then a few plants of sown mignonette in his pots and borders will come up, grow big, and never evolve any perfume. Is *odorata* a true species or a hortist's cultivated improvement? . . . But, O! my names from 1888 *Fl. W. Yk.*, which you have been unearthing, are not, I fear, to be depended upon. . . . I've found one *Scirpus*, but no *Cyperus* as yet. The waste scour-heaps get removed and spread over the land after lying one winter to "blet," and so perennials don't get much of a long rope. Vale.—Yours always truly, F. A. LEES.

I return the proof-marked page of a *Descriptive Adventive Flora of Britain*. What a chap you are for working. I visualise a picture of you, and how your eyes twinkle at congenial work: least alone when most alone!—F. A. L.

LETT, The Rev. Canon H. W., M.A., T.C.D., a distinguished Irish Cryptogamic Botanist. Born at Hillsborough, Co. Down, 1838; died at Aghaderg Glebe, Co. Down, December 1920. He assisted Stewart in the *Flora of the North-West of Ireland*, and Moyle Rogers named *Rubus Lettii* in his honour. It was at first considered endemic to Ireland, but has since been discovered in Wales. A well-known worker at Hepatics, in 1902 he published a List, with descriptive Notes, of all the species of British Hepatics hitherto found in the British Isles.

MIALL, LOUIS COMPTON, F.R.S. Born at Bradford, 1842; died at Far Headingly, Leeds, February 1921. He was the first Professor of Botany in the Yorkshire College of Science, and continued as such in the University of Leeds until 1907. The *Times* says in warm encomium—"As a naturalist he was imbued with the spirit of Gilbert White, and was an enthusiast for what he called 'live natural history.' This spirit was most highly evinced in his two remarkable books, *Round the Year* and *House, Garden, and Field*, as well as in a scholarly edition of the *Natural History of Selborne.*" Among his other publications may be mentioned *The Early Naturalists: Their Lives and Work*, 1530-1789, which is a book which should be in every naturalist's library.

M'Intosh, Charles, of Inver. Charles M'Intosh was born at the little hamlet of Inver, near Dunkeld, on the 27th March 1839. His education, scanty enough, was obtained at the village school. As a youth he worked in a sawmill, but an accident by which the fingers of his left hand were badly mutilated put an end to that occupation. Shortly after he became a rural postman, and continued at that till age brought on retirement. For forty years also he acted as precentor in the Parish Church of Little Dunkeld, and he derived much pleasure from the study and practice of music, being no mean performer on the violoncello. At an early age he began to take an interest in flowers and insects and other natural objects, but it was not till 1872, when the late Dr Buchanan White, while staying at Dunkeld, made his acquaintance and asked his help to explore the flora of the district, that he began the systematic study of nature. He was of great assistance to Dr White in many ways, notably in collecting the Willows, Roses, and Hawkweeds of the neighbourhood. By the Doctor's advice and assistance he turned his attention to the Mosses and Fungi of the locality. At a great Fungus show held in Perth in 1875 he exhibited specimens of the splendid *Pholiota aurea*, its first discovery in Britain, I believe. His fine collection of Mosses was presented by him, about a year ago, to the new School of Forestry at Dunkeld. In after years he turned his attention successively to the Uridineae, the Pyrenomycetes (of which his collection is in the Perthshire Herbarium), and latterly to the Discomycetes, of which he discovered several new to Britain and a few new to science. The microscope was always to be seen standing on his table in his little cottage at Inver. But though Botany was his special study, he was an all-round naturalist. Birds received much of his attention : why some species increased whilst others decreased, and the different effects of hard and mild seasons upon their numbers in general. The Insects of the district, as well as the Mollusca, were familiar to him, and, indeed, nothing which had life escaped his notice. On several occasions he was able to give valuable information to experts who came to investigate the pests which attack trees, especially the Conifers, which are so abundant in the neighbourhood of Dunkeld and Murthly. He was proud of the beautiful scenery amidst which he lived. It never palled upon him; its changing aspect under changing skies kept its charm ever fresh. Apart from his attainments, the man himself was worthy of all the respect with which he was universally regarded. Thoroughly upright and trustworthy, he was always ready to oblige, and his frank and genial manner, enlivened by a touch of humour, endeared him to his friends. Big and powerful of frame, he enjoyed good health till within a month or two of the end, and never lost the zest of life. He quietly breathed his last on the 5th of January last, and thus came to an end a lowly but useful and on the whole a happy life. W. BARCLAY.

ROLFE, ROBERT ALLEN, A.L.S. Born at Ruddington, near Nottingham, on 12th May 1855; died at Kew on 13th April 1921. The death of Mr Robert Allen Rolfe, which took place at Richmond, Surrey, in his sixty-sixth year, has deprived British Botany of an earnest and successful votary, and rendered the science he loved the poorer by the loss of a worker whose reputation as an orchidologist was world-wide. Rolfe, after leaving school, was trained as a gardener. For a time he worked in the gardens at Welbeck Abbey, whence he entered Kew in 1879. A vacancy having occurred in the Herbarium Staff at Kew in 1880, Rolfe was the successful competitor at the examination of candidates for the post. By way of recreation rather than as part of his routine duties he took up the study of galls, his first paper on the subject appearing in 1881. His interest in this study never abated, though the fact that he was an authority of high rank in this particular field was probably unknown to all save the few workers who give it special attention. His routine duties involved, in his earlier years of herbarium work, a close study of the flora of the Philippines, the results of which were published in 1885. This work was of such excellence as to lead to his election as an Associate of the Linnean Society. He now added to what may be termed his recreations the study of hybrids, his first contribution to which appeared in 1887. Rolfe's position as an authority in this field, though as well-deserved as that acquired by him as a student of galls, was probably as little realised by the majority of his systematic contemporaries. It was, however, fully appreciated by those engaged in practical garden craft, with whose difficulties Rolfe, thanks to his own early training, was familiar, and to whose needs he gave, throughout his career, the most sympathetic attention. His routine duties had in the meantime made him turn his attention to the Orchidaceae, and led to the publication by him in 1886 of a revision of the genus *Phalaenopsis*. The judgment revealed in this paper led his immediate superiors to encourage him to devote especial attention to this family. Other papers on Orchidaceae followed, and by 1893 his reputation as an authority on the family had become so thoroughly established that he was able to found the *Orchid Review*, the special organ of cultivators of Orchids in Britain, which he edited with success, though, it is to be feared, at the expense of such sustained labour during hours that might otherwise have been given to legitimate recreation and leisure as to impair his health. From the time of the foundation of the *Orchid Review* Rolfe held in the gardening and the botanical world alike a position comparable with that held up to 1864 by the late Professor Lindley, and that subsequently held by the late Professor Reichenbach. Endowed with a vigorous constitution, Rolfe for nearly thirty years crowded into his days and nights the labours of two ordinary mortals. His last illness and death were unexpected, for before he was laid aside he had in contemplation two important tasks—that of comparing at Vienna the species of Orchids it had fallen to him to characterise from 1886 onwards with the types of the species described by Reichenbach, which, in terms of the last testament of that distinguished man, had been sealed up at Vienna for a quarter of a century, and that of visiting in person certain regions in tropical America whence so many of the species in cultivation with which he had been compelled to deal in the course of his official duties had originally come. The frustration of these plans renders still more irreparable the loss sustained by botanical science through the disappearance of the unique and peculiar knowledge of which Rolfe was the possessor. The prescience shown by the Linnean Society in honouring itself by choosing Rolfe as one of its Associates almost at the outset of his career, and long before he became the recognised authority as regards Orchids in this country, has already been indicated. The esteem in which he was held by orchidologists abroad, both for his character as a colleague and for his authority in their particular field of study, was shown by the number and nature of the letters of regret evoked by his death from correspondents of Kew in every civilised country. His own Ministry had shown the esteem in which his attainments were held in this country by inviting him, in the public interest, to remain in its service after he had attained the age of sixty-five, at which public servants are normally retired. Early in his career the Royal Horticultural Society made him one of its corresponding members, and was thereby able to avail itself of his invaluable services as a member of its powerful Orchid Committee. But it was not until Rolfe was stricken by the illness which was to prove fatal that this body, to which he had so long rendered yeoman service, bethought itself of honouring him by the bestowal of its Victoria Medal of Honour. D. PRAIN.

WHITWELL, WILLIAM. Born at Manchester 1839; died at Dorridge, near Birmingham, December 1921. He entered the service of the Inland Revenue, and among other places was stationed from 1870 to 1877 at Oxford, where he did some botanising, and a few of his records are included in the Oxfordshire Flora. He then went to the south of England, and for some years lived at Balham. In 1886 he recorded the occurrence of *Anemone nemorosa*, var. *coerulea*, in 1870 near Tunbridge Wells (*Journ. Bot.* 157, 1887); he also noted (*l.c.*, 56) that *Silene Otites* grew on the wall of Colchester Castle, where it seems it was planted by local lepidopterists as a larval food. One of his best finds was that of *Polygala austriaca* near Caterham, Surrey ((*l.c.*, 249, 1888); and (*l.c.*, 314 and 354, 1889, and 282, 1890) he gives an account of *Arenaria gothica* found in Yorkshire by Mr Rotheray. In 1891 (*l.c.*, 308) he recorded some plants for Monmouth; *Sonchus arvensis*, var. *angustifolius*, in Lancashire (*l.c.*, 247, 1894); *Impatiens Nolitangere* in Montgomery and Salop (*l.c.*, 117, 1895); and he wrote East Sussex Notes (*l.c.*, 103, 1902), mentioning the alien *Festuca heterophylla*. In 1898 he recorded (*l.c.*, 33, 1898) *Euphorbia* *prostrata* from a nursery garden at Christchurch, Hants. His most important paper (*l.c.*, 291) was on the alleged occurrence of *Botrychium matricariaefolium* and *B. lanceolatum* in Britain. Neither of these have since been confirmed and await discovery. Montgomeryshire Notes appeared in 1896 (*l.c.*, 172, 511). In 1893 he contributed to our Club a curious form of *Thalictrum flavum* from Llansilin, Denbigh, which the Rev. E. F. Linton there named *rufinerve* Lej. & Court., a determination I doubt. The plant had an earlier history. It was originally sent to the Botanical Exchange Club in 1875 by Miss Foulkes-Jones, who found it at Llansilin. At that time Boswell Syme referred it to var. *nigricans*, and in this Mr J. G. Baker agreed. Whitwell had roots from Miss Foulkes-Jones, so this was the same gathering which I submitted to Herr J. Freyn, who named it *T. gallicum* Rouy. A renewed investigation is desirable. I have seen it in gardens in Carnarvonshire as a tall plant, six feet high. Whitwell took considerable interest in the Berkshire Strawberry (*Fl. Berks* 189), and he grew it for many years. An impulsive critic said it was *F. elatior*, and Whitwell, writing on October 29, 1900, from Balham, says:—"You asked me to take notice of the flowers of your *F. bercheriensis* this season in respect of the question whether the plant is not really *elatior*. I have done so, and have dried an excellent series showing flower-buds, flowers, and the fruit in various stages up to ripeness. The suggestion that it may be *elatior* has surprised me. The form seems to be quite different; the petals are purely orbicular; those of *elatior* are narrowed into a decided claw, and are also slightly elongated. The inflorescence in *elatior* is more erect, and calyx, pedicels, and leaves are much more hairy than in your plant. The leaves are intermediate in form between *vesca* and *elatior*. F. A. Lees at once said that it was manifestly different from *elatior*; it could not be that. Also that it was in various points distinguishable from *vesca*. . . . I have remarked before on the extreme lusciousness of your ripened fruits: three or four under gentle pressure for drying scented my study almost overpoweringly—more than a plateful of purchased strawberries would have done." These remarks have been quoted to show Whitwell's power of critical observation. Incidentally, they throw a side-light on Count Solms-Laubach's matured opinion, namely, that *bercheriensis* was a variety of *vesca* which at one time had been cultivated, and had now to some extent reverted to *vesca*, *i.e.*, it is neither *elatior* nor *vesca* × *elatior*, which he at one time thought might be its origin. Whitwell in 1902 went to live at Lower Hagley, but lost his *Fragaria* in the removal. He had a good botanical library, and it was hoped that he might have done much good work, but he was in very delicate health, and even in 1900 says "his powers of continuous and concentrated work remain painfully small, but has recovered a little of the ability to write, though only a little," and then he was chained to the oar by having his bed-ridden father living with him, then in his 90th year, and had only Whitwell to watch over him. Even in 1903, after his removal to Lower Hagley, he laments the lack of improvement in his health, and that although only 64 years of age he is only able to walk 5 or 6 miles, "while his friend Bagnall, who is 73, often does 30 miles a day, and not long ago accomplished 34 miles." One should add that Whitwell assisted Arnold Lees in indexing the *Flora of North-West Yorkshire*, and that he published a lecture on the "Life of a Fern," which he gave before the Welshpool Naturalists' Field Club, in which he alludes to many of the Ferns of Montgomeryshire.

NEW COUNTY AND OTHER RECORDS.

ABBREVIATIONS.—*Fern. Gaz.* = *The British Fern Gazette*, edited by F. W. Stansfield; *Gard. Chron.* = *The Gardeners' Chronicle*; *Ir. Nat.* = *The Irish Naturalist*; *Nat.* = *The Naturalist*; † = Adventive; * = New County Record (in the case of adventive plants this is only rarely added); ! placed after a plant name signifies that the compiler has seen the specimen; ! placed after a locality that the compiler has seen it there; × placed before one or between two scientific names means that the plant is a hybrid; 52, etc., numbers following a county refers to the Watsonian vice-county; [ ] enclosing a record means that confirmatory evidence is needed, or that the plant is not British.

4. THALICTRUM MINUS L. (*montanum*). Paviland Cliffs, Glamorgan, WAKEFIELD & WEBB.

†10. ANEMONE RANUNCULOIDES L. On a hedge bank, Sewerby, York, R. J. FLINTOFF.

†13. A. JAPONICA S. & Z. Alien. Churchill Heath, Oxon, Miss FOWLER, with *A. apennina* L. Known for many years.

17. MYOSURUS MINIMUS L. Artington, Surrey, O. LATTER, *in litt.*

*21. RANUNCULUS AURICOMUS L. Ballycarew, Wexford, MOFFAT in *Irish Nat.* 72, 1921.

23. R. LINGUA L. Hunmanby, near Bridlington, York, FLINTOFF.

*38. R. TRICHOPHYLLUS Chaix. Near Loch Spiggie, Shetland. (Beeby's *trichophyllus* from Walls turned out to be *Drouetii.*)

*40. R. HETEROPHYLLUS Web. Dunean Loch, Fife, TEMPLEMAN. Forma GODRONII. Carlton Field, Notts, R. BULLEY.

41. R. PSEUDOFLUITANS Baker & Foggitt. Wollaton Canal, Notts, R. BULLEY.

47. R. FICARIA L., f. LUXURIANS Moss. Brixton, Isle of Wight, probably only a state induced by growing in wet places, DRUCE.

48. CALTHA PALUSTRIS L., var. GUERANGERII (Bor.). Between Hartford Bridge and Bramshill, Hants, J. W. THOMPSON. Var. MINOR DC. Carnedd Dafydd (2900 ft.), Carnarvonshire, DRUCE.

*52. HELLEBORUS FOETIDUS L. Llandifaelog, Carmarthen, BARKER. Not native. Sewerby, York, FLINTOFF.

†55. NIGELLA DAMASCENA L. Hortal. Longland Bog Cliffs, Glamorgan, WEBB.

†56. N. ARVENSIS L. Uxbridge, Middlesex, Mrs WEDGWOOD.

77. CASTALIA ALBA Wood. Llanaber, Merioneth (lacked pers. auth.), DRUCE.

80. PAPAVER RHOEAS L., var. HOFFMANNIANUM Kuntze. Wilsford, Wilts, DRUCE. Var. VIOLACEUM Bréb. Near Eastbourne, Sussex, C. NICHOLSON.

†93. ESCHSCHOLZIA DOUGLASII Walp. Near grain-store, Dalmuir, Glasgow, GRIERSON.

†101. CAPNOIDES LUTEA Gaertn. Fruiting at Torquay, C. BAILEY, and at Radley, Berks, VINCENT.

104. FUMARIA PALLIDIFLORA Jord. Conwyl, Carmarthen, BRUNKER, ex HAMER.

*108. F. MURALIS Sond., var. DICIPIENS, but fruit required (teste Pugsley) for precise identification. Parkstone, Dorset, Miss TODD.

†131. BARBAREA INTERMEDIA Bor. Gravel pit, Chichester, LITTLE.

138. ARABIS ALPINA L. Still in the spot where we saw it on the Cuchullin, Skye, in 1907 ; just over flower on July 13, 1921, DRUCE.

†*141. A. GLABRA Bernh. Ibrox, Glasgow, GRIERSON.

142. CARDAMINE PRATENSIS L. Beautiful flore pleno plants. Between St Anne's Hill and Thorpe, Surrey, Miss TULK.

143. C. AMARA L., var. ERUBESCENS Peterm. Bungay, Suffolk, Miss COBBE ; Burnhall, York, T. C. TAYLOR.

†149. LUNARIA REDIVIVA L. Chadlington, Oxon, DRUCE ; Pennal, Merioneth, Mrs WEDGWOOD ; Dundee, Forfar, DRUCE ; near St Asaph, Flint, B. ALLEN.

†158. ALYSSUM MARITIMUM Lam. Bexhill, Sussex, H. L. GREEN.

†159. DRABA AIZOIDES L. Planted on a wall at Charmouth, Dorset, TEMPLEMAN.

161. D. INCANA L., var. CONFUSA (Ehrh.). Caenlochan, Forfar, PATTON.

†176. HESPERIS MATRONALIS L. Havant, S. Hants, HILLARD; Goathland, York, FLINTOFF.

†177. WILCKIA MARITIMA Scop. Near Goathland, York, FLINTOFF; Port Talbot, Glamorgan, WEBB.

†183. SISYMBRIUM SOPHIA L. Gwys, Brecon, WEBB.

†185. S. ORIENTALE L. Colchester [Ref. No. 1884], BROWN; Chipping Norton, Oxon, DRUCE; St Ouen's Bay, Jersey, as *Brassica*, PIQUET; Uxbridge, Middlesex, TRETHEWY; Minfford, Merioneth; Gloucester Dock, GAMBIER-PARRY.

†187. S. LOESELII L. Eltham, Kent, Mrs WEDGWOOD.

†195. ERYSIMUM HIERACIFOLIUM L. Meole Brace, Salop, MELVILL.

197. E. CHEIRANTHOIDES L. Havant, S. Hants, Miss HILLARD.

†198. E. REPANDUM L. Hertford, 1845, as *C. Cheiri*, ANSELL in *Hb. Druce*, and at Ware, 1914, Mrs WEDGWOOD.

†200. CONRINGIA ORIENTALIS Dum. By the railway at Grosmont, N.-W. Yorks, FLINTOFF; near Trefnant, Denbigh, B. ALLEN.

†202. CAMELINA SATIVA Cr., var. PILOSA (DC.) = FOETIDA. St Ouen's Bay, Jersey, 1896, PIQUET.

*205. BRASSICA OLERACEA L. Walberswick, E. Suffolk, W. G. CLARKE.

†212. B. ELONGATA Ehrh. Grosmont, Goathland, N.-W. Yorks, FLINTOFF.

*215. B. NIGRA Koch. Pembrey, Carmarthen, BARKER, ex HAMER.

†222. B. POLLICHII (Sch. & Sp.) Druce = B. GALLICA (Willd.). Winchester, Miss TODD; Newhaven, Sussex, Mrs WEDGWOOD.

†224. B. INCANA Schultz. Newhaven, Sussex, Lady DAVY.

†228. ERUCA SATIVA Mill. Monks Meadow, Gloster, ex RIDDELSDELL.

†228 (2). E. CAPPODOCICA Reuter. Glasson Docks, Lancs, Miss A. B. COBBE.

*232. BURSA BRITTONII (Almq.). Dundee, Forfar, DRUCE.

B. BATAVORUM (Almq.). St Helier, Jersey; (S. Servan, Brittany), DRUCE; Grangetown, Cardiff, 1920, WADE, as var. *densiflora*—see *Rep. B.E.C.* (the smaller species only) 214, 1920; Erith, Kent; Bradford, York, DRUCE.

B. ANGLICA (Almq.). Balta, Shetland; Yardley Gobion, Northants; Sible Hedingham, Essex, DRUCE.

B. CONCAVA (Almq.). Mallow, Cork, September 1921, DRUCE.

B. BREMENSIS (Almq.). Walmer, E. Kent, H. E. FOX. See *Rep. B.E.C.* 214, 1920.

B. BELGICA (Almq.). Lerwick, Shetland, DRUCE.

B. DRUCEANA Almq. Killarney, Kerry, DRUCE.

B. GERMANICA × PATAGONICA? Cottenham Park Road, West Wimbledon, Surrey, 1921, C. E. BRITTON [n. 590], queried as this by Dr Almquist. Mr Britton had suggested a hybrid origin of this sterile plant.

(B. LAEVIGATA (Almq.). Zeebrugge, Belgium, 1921, DRUCE.)

†233. CORONOPUS DIDYMA Sm. Charterhouse, Surrey, O. H. LATTER.

236. LEPIDUM LATIFOLIUM L. Gloster Dock, GAMBIER-PARRY; †*on grass by the roadside, Potterne, Wilts, GWATKIN.

†239. L. PERFOLIATUM L. Carmarthen, HAMER; Galway, TRETHEWY.

240. L. RUDERALE L. Porthdinlleyn, Carnarvon, GENNER.

†240 (2). L. NEGLECTUM Thell. Thetford, Norfolk, Miss COBBE.

†241. L. SATIVUM L. Hayling Island, S. Hants, with mauve flowers, HILLARD; Carshalton, Surrey, BISHOP.

†247. L. DENSIFLORUM Schrad. Gloucester, GAMBIER-PARRY; Glasgow, GRIERSON; Watton, Norfolk, Mrs WEDGWOOD.

†247 (17). L. SCHINZII Thell. Bradford, York, CRYER, with *L. sagittulatum* Thell. and *L. hyssopifolium* Desf., etc.

†247 (31). L. RAMOSSISSIMUM Nels. Southampton, RAYNER; Glasgow, GRIERSON.

*249. THLASPI ARVENSE L. Carmarthen, HAMER.

250. T. PERFOLIATUM L. Prestwood, Bucks, confirmatory record, ADRIANA WHITE; Quarry, Bearborough, Cutsdeane, Worcester, R. BUTCHER.

*251. T. ALPESTRE L. By the River Ystwyth, near Llanychaiarn, Cardigan, a few feet above sea-level, as a form approaching *occitanicum*, MARQUAND.

†258. VOGELIA PANICULATA Hornem. North Cadbury, N. Somerset, BOYS; Acton, Middlesex, Mrs WEDGWOOD.

*291. VIOLA STAGNINA Kit. W. Dereham Fen, W. Norfolk, A. TEMPLEMAN.

294. V. RIVINIANA Reichb., var. PSEUDOMIRABILIS. Lough Corrib, Galway, Mrs EVANS & A. W. TRETHEWY; Gap of Dunloe, Flesk Valley, Kerry; Shetland, DRUCE. × RUPESTRIS. Rozel, Jersey, DRUCE; near Dyers Farn, Langley; Hitchin, Herts, LITTLE.

*295. V. RUPESTRIS Schmidt. At Langley, Herts, with above, LITTLE.

296. V. CANINA L. Bressay, Shetland. Var. CALCAREA Reichb. Balta, Unst, DRUCE. × RUPESTRIS. Cronkley Fell, York, KEW, but Mrs Gregory would like more advanced specimens. × STAGNINA. Dereham Fen, W. Norfolk, A. TEMPLEMAN.

298. V. ODORATA L., var. PRAECOX. Potters Pury, Northants, DRUCE.

298 (2). V. FLORIBUNDA Jord. Still at Cobham, Kent, a form with remarkably large flowers, Mrs STEVENS.

*301 (2). V. EPIPSILA Ledeb. Glen Cahir, Clare, DRUCE. Var. GLABRESCENS. Mallow, Co. Cork, DRUCE.

304. V. LLOYDII Jord. Carmarthen, BARKER; *Tingwall, Shetland; near Kirkwall, Orkney, DRUCE.

304. V. SEGETALIS Jord. Parkstone, Dorset, Miss TODD.

*308. POLYGALA SERPYLLACEA Weihe. Cominin-y-Rhos, Glamorgan, WEBB.

310. P. DUBIA Bellynck. Tenby, Pembroke; Dancing Ledge, Dorset; Wye Downs, Kent; Hartland Point, N. Devon; St Ouen's, Jersey, DRUCE.

†320. DIANTHUS BARBATUS L. In a wood near Powick, Worcester, Miss BOLTON; waste ground, Dundee, Forfar, DRUCE.

†328. GYPSOPHILA PANICULATA L. Blackpill, Glamorgan, on ballast, WEBB.

†330 (2). G. ELEGANS Bieb. Glasgow, GRIERSON.

†331. SAPONARIA VACCARIA L. On rubbish on the beach, Auchindour, Westerness, WEBB.

336. SILENE CUCUBALUS Wib., var. RUBRA (DC.) Druce. See *Rep. B.E.C.* 188, 1915. Hythe Quay, Colchester, BROWN.

†342. S. GALLICA L. Bradford, York, CRYER; Glasgow, GRIERSON.

†347. S. ARMERIA L., var. SPARSIFLORA Schur. Near Exeter, Miss TODD.

*357. CUCUBALUS BACCIFER L. Among low shrubs on a cliff overhanging the sea at Woody Bay, N. Devon, 1920, Rev. H. E. Fox. A very interesting discovery. Its occurrence here has to be accounted for. Can it have come with shrubs, or is it native?

*372. CERASTIUM PUMILUM Curt. Very plentiful on the Great Orme, Carnarvon, March 1921, Rev. E. M. REYNOLDS. An important extension northwards of its range.

*373. C. SEMIDECANDRUM L. Carmarthen, BARKER, ex HAMER.

374. C. SUBTETRANDRUM Murb. Black Holm, 1916; Eday, S. Ronaldsay, Hoy, Col. JOHNSTON. I have not seen the specimens of this very critical plant, which should be authenticated by Murbeck or Ostenfeld.

*380. STELLARIA NEGLECTA Weihe, var. UMBROSA Opiz. Waulkmill Bay, Orkney, 1920, DRUCE.

382. S. DILLENIANA Mönch. Fen, Shouldham, W. Norfolk, LITTLE.

†418. CLAYTONIA SIBIRICA L. Bredon Hill, Worcester, C. REA.

*424. ELATINE HEXANDRA DC. Hensoe, Glamorgan, Miss VACHELL. An excellent addition to the county flora.

435. HYPERICUM DESETANGSII Lam. Lewes, Sussex, 1850, IBBOTSON, in *Hb. Druce.*

†445. LAVATERA CRETICA L. Bradford, York, CRYER.

†456. MALVA PARVIFLORA L. Christchurch, S. Hants, as var. *microcarpa* Losc., Miss TODD.

465. TILIA ULMIFOLIA Scop. Dolgelly, Merioneth, DRUCE; *Gwynfey, Carmarthen, HAMER; Boot, Cumberland, J. F. PICKARD, ? planted.

477. GERANIUM SYLVATICUM L., var. or sub-var. ROSEUM Druce. Nent, Alston, Cumberland, WATERFALL.

478. G. PRATENSE L. Near Penrice Church, Glamorgan, ? if adventive, WEBB.

†479. G. ENDRESSI Gay. Skelwith, N. Lancs, J. W. H., ex RIDDELSDELL.

†479. G. PHAEUM L. Horbling, near Billingborough, Lincs, Miss LANDON; Sleights, near Whitby, York, FLINTOFF; Holt Park, Windermere, Mrs EVANS.

*483. G. DISSECTUM L. Garden weed at Balta, Shetland, DRUCE.

†490 (3). ERODIUM BRACHYCARPUM Thell. Shirley and Bradford, York, CRYER; Meanwood, Leeds, DRUCE.

†491. E. CHIUM Willd. Countess Wear, Devon, D'URBAN. Perhaps a form of this, teste Dr Thellung.

497. E. CICUTARIUM Ait., var. TRIVIALE (or near it). Dog's Bay, Galway, DRUCE, teste BAKER.

†499. E. CYGNORUM Nees. Railway between Nailsworth and Dunkirk, W. Gloster, 1865, spec. ex RIDDELSDELL.

†501. TROPAEOLUM MAJUS L. Mayals, Glamorgan, WEBB.

504. OXALIS ACETOSELLA, L., var. SUBPURPURASCENS DC. Challock, near Ashford, Kent, H. L. GREEN.

†505. O. CORNICULATA L., var. PURPUREA Parl. Bexhill, Sussex, H. L. GREEN.

†508. O. VIOLACEA DC. Near Welbeck, Notts, GOULDING.

†509 (2). O. FLORIBUNDA Lehm. Helensburgh, Dumbarton; Bray, Dublin, GRIERSON.

†512. IMPATIENS PARVIFLORA DC. Wood near Stanley, Staithe; near Beccles, Suffolk, Rev. G. HALLIDAY.

†513. I. GLANDULIFERA Royle. Near Newark, Surrey, Lady DAVY.

†515. RUTA GRAVEOLENS L. Bexhill, Sussex, H. L. GREEN.

†522. VITIS HEDERACEA L. Marston, Oxon, DRUCE.

526. Acer campestre L. A tree, 35 feet high, near Welshpool, Montgomery; *Penruddock, Cumberland, J. A. Webb. Var. incisifolia. Ufton, Warwick; Twinstead, N. Essex, Druce.

†528. Lupinus nootkatensis Donn. On shingle of the Lochy, near Inverlochy Castle, Westerness, Webb.

†529. L. angustifolius L. In a field, on the blue galt, sown with beans, at the base of the North Downs, between Woldingham and Oxted, Surrey, Rev. E. C. Crutwell; Radyr, Glamorgan, Smith.

†531. Laburnum anagyroides Med. Semi-wild in Lady Portsmouth's Park, Hants, Boys; Greenhithe chalk-pit, Kent; Fairford, Gloster, Druce; spreading to limestone cliffs at Langland, Glamorgan, Webb.

†554. Trigonella M.-caerulea (Ser.) Druce. Eltham. Kent, 1921, Mrs Wedgwood.

†578. Medicago praecox DC. Abingdon, Berks, Gambier-Parry.

†579. M. hispida Gaertn., var. confinis Burnat. [Ref. No. 1798.] Hythe Quay, Colchester, Brown.

586. M. lupulina L., var. Willdenowiana Koch. Radyr, Glamorgan, Smith; Kirkwall, Orkney, Druce.

†597. Melilotus indica All. Minfford, Merioneth, Gambier-Parry.

599. Trifolium pratense L., var. parviflorum Bab. Dundee, Forfar, Druce.

†605. T. lappaceum L. Eltham. Kent, Mrs Wedgwood; Leith, Fraser.

610. T. stellatum L. After many vicissitudes this clover reappeared at Shoreham. Sussex, in 1921, Miss Cottis; with other aliens at Fforestfach, Glamorgan, Rowlands, ex Webb.

619. T. STRIATUM L., var. ERECTUM Gasp. Tresco, Scilly, Dr H. DOWNES.

621. T. FRAGIFERUM L. On a dry football field, Swansea, abundant, WEBB.

†626. T. STRICTUM L. Leith, FRASER, with *T. Michelianum* Savi, etc.

628. T. REPENS L., var. RUBESCENS Ser. Ranworth, E. Norfolk, Mrs WEDGWOOD.

†630 (2). T. ISTHMOCARPUM Brot. Leith Docks, FRASER; Byfleet. Surrey, DRUCE.

†638. T. FILIFORME L. Leith Docks, FRASER.

641. ANTHYLLIS VULNERARIA L., var. BICOLOR (R. & F.). Birling Gap, Sussex, Mrs WEDGWOOD.

648. LOTUS TENUIS Kit. Leighton Buzzard, Beds, TEMPLEMAN. Rare in the county, whence I first recorded it from Twin Woods in 1896.

†665. SCORPIURUS SUBVILLOSA L. Leith Docks, plentiful, with *S. vermiculata*, FRASER.

†666. CORONILLA VARIA L. The Rev. H. H. Harvey says he got it at Ashwater, S. Devon, some years ago. Mr Wise found it at Lipton Quarries previous to that. Llandefailog, Carmarthen, BARKER.

†686. VICIA CALCARATA Desf. Colchester, BROWN.

†690. V. NARBONENSIS L. Tenbury, Worcester. 1915, Mrs WEDGWOOD.

†695. V. MELANOPS Sibth. & Sm. Frome, Somerset, Mrs WEDGWOOD.

†697. V. CORDATA Wulf. Colchester, BROWN; Hayes, Kent, Mrs WEDGWOOD.

†701. V. PEREGRINA L. Colchester, BROWN.

706. V. GRACILIS Lois. Shenley Hill, Beds, TEMPLEMAN.

710. LATHYRUS SYLVESTRIS L., var. LATIFOLIUS Peterm. Caldy Island, Pembroke, ARNETT.

†711. L. TUBEROSUS L. Near Dartmouth, Devon, found by a Cadet, R. MILNE.

712. L. MARITIMUS Big. Salthouse, E. Norfolk, HORWOOD.

†717. L. INCONSPICUUS L. Hertford, A. W. GRAVESON.

†718. L. HIRSUTUS L. North Cliff, Bridlington, York, FLINTOFF.

†721. L. CICERA L. Hythe Quay, Colchester, BROWN.

†724. L. OCHRUS L. Colchester, BROWN.

729. L. MONTANUS Bernh., var. TENUIFOLIUS Garcke. Aymestrey, Hereford, DALTRY.

*738. PRUNUS CERASUS L. Carmarthen, KNIGHT, ex HAMER.

746. SPIRAEA ULMARIA L., var. DENUDATA Boenn. Potterne, Wilts, GWATKIN; Mallow, Cork, DRUCE.

†848. RUBUS SPECTABILIS Pursh. Duff House Grounds, Banff, with *_R. nutkanus_, WATT in _Glasgow Nat._ 66, 1918.

883. GEUM INTERMEDIUM Ehrh. Ufton Wood, Warwick, also a form with a single, rose-coloured, sessile flower, DRUCE.

†885. FRAGARIA MOSCHATA Duch. Site of an old cottage, destroyed about 40 years ago, Potterne, Wilts, GWATKIN.

886. F. VESCA L. With white fruit, Bramshill Wood, N. Hants, Mrs THOMPSON.

†896. POTENTILLA INTERMEDIA L. Gloucester Docks, GAMBIER-PARRY.

901. P. REPTANS L. With trifoliate leaves, Aldwick, Bognor, W. Sussex, LITTLE.

†904. P. ALBA L. On the grassy bank of a garden which until recently had been virgin wood, "evidently not intentionally planted and apparently quite wild," Hythe, Kent, Mrs MURRAY. Doubtless introduced. See "Dubious Plants," in *Rep. B.E.C.* 756, 1919.

909. ALCHEMILLA MINOR Huds. Setter, Syradale, Kirbister, Orkney; near Morley Bridge, Kerry, DRUCE.

909. A. ALPESTRIS Schmidt. *Balta, Shetland; Kirbister, Orkney; *near Montgomery, DRUCE.

†916. ACAENA ANSERINIFOLIA (Forst.) Druce (= *Sanguisorbae*). Near Lucan, MOFFAT; Rostrevor, in the grounds of Sir J. Ross at Bladensburg, PRAEGER in *Irish Nat.* 1921. Doubtless here of hortal origin.

*931 (2). ROSA ACICULATA grex. One of the roses of this rare British group was found on the border of Whittlebury Forest, Northants, in October last. It had very large fruit with subpersistent sepals; leaves biserrate, hairy on the under surface; the peduncles densely aciculate with gland-topped setae, DRUCE.

950. R. RUBELLA Sm. Col. Wolley-Dod so names a red-flowered *spinosissima* Rose from Dog's Bay, Galway, collected by Mrs WEDGWOOD in September 1920. I have the same plant from Co. Clare, but doubted its identity with *rubella* Sm., DRUCE.

963. PYRUS TORMINALIS Ehrh. Layer Marney, Essex, BROWN.

966. CRATAEGUS MONOGYNA Jacq., var. LACINIATA Wallr. Mallow, Cork, DRUCE; Lochyside, Westerness, with var. *incisifolia* Druce, WEBB.

†972. COTONEASTER MICROPHYLLA Wall. Bont Newydd, Carnarvon, B. ALLEN; edge of Lingholm Wood, Cumberland, J. A. WEBB.

†972 (2). C. SIMONSII Baker. Island in Lough Corrib, Galway, TRETHEWY.

†972 (3). C. FRIGIDA Lindley. In a hedge at Bishops Stortford, Hants, Hon. Mrs LEITH.

975. SAXIFRAGA OPPOSITIFOLIA L. Cwm Tarrell, B. A. WILLIAMS.

978. S. DECIPIENS Ehrh. Sea scarp of Croaghmore, on Clare Island, 200-1200 ft., PRAEGER.

*1010. SEDUM FABARIA. Carmarthen, HAMER.

*1011. S. RUPESTRE Huds., var. MINUS Syme. Llangunnor, Carmarthen, HAMER.

†1012. S. REFLEXUM L. St Clears, Carmarthen Walls, HAMER; In masses on rock, Llandewir Cwm; Builth, nowhere near houses, WEBB.

1014. S. SEXANGULARE L. Langdon, near Tewkesbury, W. Gloster, Miss VACHELL.

*1045. LYTHRUM HYSSOPIFOLIA L. Hayling Island, S. Hants, Miss HILLARD. A capital discovery. Alien at Burnley, Lancs, TRAVIS.

1052. EPILOBIUM ROSEUM Schreb. Hambleden, Bucks; Meanwood, Leeds, DRUCE.

1054. E. MONTANUM × PARVIFLORUM. Swaythling, S. Hants, RAYNER.

1055. E. ALSINEFOLIUM × PALUSTRE. Margin of Maze Beck, near Caldron Snout, H. W. KEW.

1057. E. PALUSTRE × PARVIFLORUM. Ippolyts Common, Hitchin, Herts, LITTLE.

1059. LUDVIGIA PALUSTRIS Ell. Plentiful this year in its old station in the New Forest. Miss TODD also found it in a pond about two miles from Romsey, S. Hants.

†1067. OENOTHERA LACINIATA Hill (*sinuata*). Gloucester,

Mount Meadow, GAMBIER-PARRY; Knap Mill, Christchurch, S. Hants, Miss TODD.

†1075 (6). CUCUMIS MYRIOCARPUS Naudin. Named at Kew. Still at Bradford, and at Meanwood, Leeds, DRUCE.

†1077. MESEMBRYANTHEMUM EDULE L. Crude Bay, N. Devon, Hon. Mrs ADEANE.

1126. ANTHRISCUS SYLVESTRIS Hoffm., var. ANGUSTISECTA Druce. Ballyvaughan, Clare; Mallow, Cork, DRUCE.

1135. OENANTHE PIMPINELLOIDES L. Tellisford, Somerset, GWATKIN.

1147. ANGELICA SYLVESTRIS L., var. DECURRENS Wallr. By the Roughty River, Kerry; Roundstone, Galway; Mallow, Cork; Ballyvaughan, Co. Clare; Sligachan, Skye; Balta, Unst, DRUCE. Mull, Hebrides, TAYLOR.

†1152 (2). PEUCEDANUM GRAVEOLENS B. & H. Hertford gravel-pit, GRAVESON; Bradford, CRYER; Abingdon, Berks, GAMBIER-PARRY.

†1157. CORIANDRUM SATIVUM L. Glasson Docks, N. Lancs, Miss M. COBBE.

1182. SYMPHORICARPOS RACEMOSUS Michx. Greenhithe, Kent, DRUCE.

1194. GALIUM ERECTUM Huds. Near Brighton, Sussex, as a small neat form, Miss COTTIS; railway side near Carlisle, WEBB & DRUCE.

*1201. G. TRICORNE Stokes. Carmarthen, HAMER.

†1211. ASPERULA CILIATA Rochel. Malvern Beacon, Worcester, WALL.

1216. VALERIANA SAMBUCIFOLIA Mikan. Watton, Caithness; Syradale, Orkney, DRUCE.

*†1223. VALERIANELLA ERIOCARPA Desf. Hayling Isle, S. Hants, Miss HILLARD.

†1245. SOLIDAGO SEROTINA Ait. Sutton Courtney, Berks; Marston, Oxon, DRUCE.

1248. BELLIS PERENNIS L., lusus PROLIFERA. The Hen-and-Chicken variety. Near Badminton, Gloster, W. D. HARFORD; Devon, Mrs SANDWITH. †Var. HYBRIDA (Ten.). Leith Docks, FRASER.

†1252. ASTER TRADESCANTI A. Gray. Ref. No. 2318, between Hammersmith Bridge and Barnes, Thames-side; Ref. Nos. 2308, 2310, near Richmond, Surrey, BRITTON. Near *A. parviflorus* Nees.

†1255. A. NOVI-BELGII L. Ref. No. 2326, Thames-side above Putney, Surrey, and Ref. No. 2316 above Kew, BRITTON; Lochyside, Mid Perth, WEBB; Gwys, Brecon, WEBB.

†1255. A. FLORIBUNDUS Willd. Ref. No. 2307, Thames-side, between Richmond and Ham, Surrey, BRITTON.

†1256. A. VERSICOLOR Willd., em. Thell. Ref. No. 2309. Thames-side above Richmond, Surrey, BRITTON; Fleet Pond, Hants, MONCKTON.

1258. A. TRIPOLIUM L., var. DISCOIDEUS Reichb. Saundersfoot, Pembroke, ARNETT.

The Asters are named by Dr Thellung.

1261. ERIGERON ACRIS L., with white pappus (*serotina*). Greenhithe, Kent, DRUCE.

†1262. E. CANADENSE L. Billington, Beds, TEMPLEMAN.

1279. INULA HELENIUM L. South side of Boar's Hill, Berks, E. ALLEN; Grosmont, N.-E. Yorks, FLINTOFF.

†1284. I. VISCOSA Aiton. Barry, Glamorgan, R. SMITH.

†1294. XANTHIUM STRUMARIUM L. Hythe Quay, Colchester, BROWN.

†1306. GUIZOTIA ABYSSINICA Cass. Colchester, J. E. HUNWICKE.

1310. BIDENS TRIPARTITA L., var. MINOR W. & G. With nearly simple leaves, Portfield, Chichester. The barbs of the fruit vary in number, LITTLE.

†1315. HEMIZONIA PUNGENS Torr. & Gray. Moulsford, Berks, Miss NEILD.

1337. DIOTIS MARITIMA Cass. Several hundreds of plants in one of the Scilly Isles, Dr H. DOWNES.

*1362 (2). MATRICARIA OCCIDENTALIS Greene. Limerick; Sligo, PRAEGER.

†1389. DORONICUM PLANTAGINEUM L. Widdington, Essex, Mrs WEDGWOOD.

1393. SENECIO AQUATICUS Hill, var. PENNATIFIDUS Gren. & Godr. Bodorgan, Anglesey, DRUCE; Carmarthen, HAMER.

*1395. S. ERUCIFOLIUS L. Llanstephan, Carmarthen, HAMER.

1400. S. SYLVATICUS L., var. AURICULATUS Meyer. Carmarthen, HAMER.

1401. S. VULGARIS L. *S. radiatus*, var. *multicaulis* Trow, with cream-coloured ligule. Cardiff, Glamorgan, Miss VACHELL.

†1402. S. CINERARIA DC. Shingle bank, west side of Pagham Harbour, W. Sussex, 1917. LITTLE.

†1411. CALENDULA ARVENSIS L. Pyrford, Surrey, Mrs WEDGWOOD.

*1418. ARCTIUM LAPPA L. Pendine, Carmarthen, KNIGHT, ex HAMER.

1420. A. NEMOROSUM Lej. Swaythling, S. Hants, RAYNER; *Llandovery, Carmarthen, KNIGHT.

1424. CARDUUS CRISPUS L., vera. Near Dorking, Surrey, MONCKTON.

1434. CIRSIUM PALUSTRE Scop., var. FEROX Druce. Ranmore

Common, Surrey, MONCKTON; near Sligachan, Skye; Strathcarron, W. Ross, DRUCE.

†1441. ONOPORDON ILLYRICUM L. St Philip's Marsh, W. Gloster, Miss I. M. ROPER.

1451. CENTAUREA PRATENSIS Thuill. Near Cirencester, Gloster, GREENWOOD.

1451. C. OBSCURA Jord. Kyle of Lochalsh, W. Ross; Sligachan, Skye; Dundee, Forfar; Cove, Kincardine; Par, Cornwall; St Albans, Herts; Mallow, Cork; Glen Flesk, Kerry; Roundstone, Galway; Cahir, Clare, DRUCE.

†1459. C. DIFFUSA Lam. Uxbridge, Middlesex, Mrs WEDGWOOD; Monk Meadow, Gloster, GAMBIER-PARRY; Glasgow, GRIERSON.

†1462. C. SOLSTITIALIS L. Hethersett, E. Norfolk, CLARKE.

†1476. CARTHAMUS LANATUS L. Radyr, Glamorgan, R. SMITH.

*1492. CREPIS MOLLIS Aschers. Nenthead, near Alston, Cumberland, WATERFALL.

1494. C. BIENNIS L. Potterne, Wilts, GWATKIN; near Abberley, Worcester, DRUCE.

†1495. C. NICAEENSIS Balb. Shalford, S. Hants, Miss TODD. The Orkney Flora plant from Kirkwall Reservoir is (teste Dr Thellung) a var. of *C. capillaris*.

†1504. LAGOSERIS NEUMAUSENSIS (Gouan) Koch. (*Pterotheca sancta* Koch). Among sainfoin, Wilbury Hill, Beds, LITTLE.

†1509. HIERACIUM PRATENSE Tausch. Near the railway, Bromsgrove, Worcester, Miss WILKINSON.

1563. H. SANGUINEUM Ley. Dalmahoy, Edinburgh, BELL; Glen Tilt, E. Perth, 1882, DRUCE.

1565. H. MURORUM L., var. SUBTENUE (W.R.L.). Glen Dole, Forfar, 1915, DRUCE.

1575. H. CREBRIDENS Dahlst. Teesdale, Durham, 1896, DRUCE; Carmarthen Van, LEY.

1584. H. SAGITTATUM Lindb., var. PHILANTHRAX Dahlst. Cane End, Oxon, 1906, DRUCE.

1584 (2). H. LINTONI Ley. Rannoch, Mid Perth. 1915, DRUCE.

1590. H. DECOLOR Ley. Moorfoot Hills, near Edinburgh, BELL.

1599. H. VULGATUM Fr., var. SUBRAVUSCULUM W. R. L. Machyntlleth, Montgomery, DRUCE.

1607. H. MACULATUM Sm. Newburgh, Fife. Miss TODD.

1609. H. SCIAPHILUM Uechtr. Bromsgrove, Worcester. WILKINSON; Benslow, Hitchin, Herts, LITTLE.

1609. H. TRANSIENS Ley. Shifnal, Salop. *Hb. Druce.*

1623. H. TRUNCATUM Lindb., forma. Near John o' Groats, Caithness, DRUCE.

1629. H. TRIDENTATUM Fr. Tiptree Heath, Essex, Mrs WEDGWOOD and BROWN; Studland, Dorset, Miss TODD.

1637. H. BOREALE Fr., var. QUERCETORUM (Jord.). Dunnet, Caithness, DRUCE. Var. DUMOSUM (Jord.). Cramond Bridge, Edinburgh, DRUCE. Var. HERVIERII (Jord.). Selham, Sussex, LITTLE; Taplow, Bucks, DRUCE.

(*Mr J. Cryer has named most of the* Hieracia.).

1640. HYPOCHAERIS RADICATA L., var. LEIOCEPHALA Regel. Shilley Green, Herts: Wallington Hall and Tottenhill, W. Norfolk, LITTLE.

1644. LEONTODON NUDICAULIS Banks, var. LASIOLENA (Bisch.) Druce. Wymondley, Herts, LITTLE.

*1645. TARAXACUM NAEVOSUM Dahlst. Erith Marshes, Kent; Pyrford, Surrey; Twinstead, N. Essex, DRUCE.

†1651. Lactuca muralis Fres. Near Burntisland, Fife, naturalised, Templeman.

1657. Sonchus asper Hill, var. pungens Bisch. Thorne Waste, York, Mrs Wedgwood.

1658. S. oleraceus L., var. triangularis Dum. Pyrford, Surrey; St Neot's, Hunts; Lichfield, Staffs, Druce. Var. lacerus Willd. Greenhithe, Kent; Chipping Norton, Oxon, Druce.

1669. Phyteuma spicatum L. Still at Abbot's Wood, Arlington, Sussex, Dymes.

*1672. Campanula latifolia L. Hendrefoilan, Skirrow, Glamorgan, Webb.

1706. Rhododendron ponticum L. Seeding in rocky places, Torrent Glen, Dolgelly, Merioneth, Webb.

1707. Pyrola rotundifolia L. A form intermediate between the type and var. *maritima* was sent from black bog earth in the Broads district of E. Norfolk by W. H. St Quintin. *Forma chloranthiflora Not. Scorriclett, 7 miles west of Wick, Caithness, N.C.R., R. Bain in *Wats. B.E.C.* 144, 1920-1.

1713. Limonium vulgare Mill, var. pyramidale Druce. Christchurch, S. Hants, Miss Todd.

1723. Hottonia palustris L. Abergwili, Carmarthen, Brunker.

1726. Primula veris L. With dark red corolla in a meadow at Melmerby, Cumberland, Rev. W. W. Mason.

1745. Centunculus minimus L. Pembrey, Carmarthen, Knight.

1758. Centaurium capitatum Druce. Llanstephan, Carmarthen, Hamer.

1760. Gentiana Pneumonanthe L. Cropton Moor, near

Pickering, N. Yorks; first found by Miss CADBURY; flowering well, 1921, FLINTOFF.

*1763. G. AMARELLA L. Near Ystradfellte, Brecon, B. A. WILLIAMS.

1763. G. AMARELLA L., var. PRAECOX Raf. Steyning, Sussex, Miss COTTIS; Ivinghoe, Bucks, REDGROVE. I saw it there in 1898. Braunton Burrows, N. Devon, H. DOWNES. *Type on hill above Fort William, Westerness. WEBB. I have not seen the specimen.

*1765. G. CAMPESTRIS L. Near Ystradfellte, Brecon. B. A. WILLIAMS.

†1778. PHACELIA CILIATA Benth. Burton-on-Trent. Staffs, CHIPPERFIELD.

†1781. HELIOTROPIUM EUROPAEUM L. Ware, Herts, Mrs WEDGWOOD.

†1783. OMPHALODES VERNA Moench. Naturalised at Highnam, W. Gloster, GAMBIER-PARRY.

1784. CYNOGLOSSUM OFFICINALE L., var. ALBUM. Watchet, Somerset. H. DOWNES.

†1787. LAPPULA ECHINATA Gilib. Mirfield. York, T. C. TAYLOR.

†1789 (3). BENTHAMIA LYCOPSIOIDES Lindl. (AMSINCKIA). Haslemere, Surrey, TEMPERLEY.

†1789 (6). B. MENZIESII (Nels. & McBride). Newport, Countess Wear, S. Devon, D'URBAN; Headley, Surrey, REDGROVE.

†1791. SYMPHYTUM TUBEROSUM L. Thundridge, Hertford, 1848, COLEMAN; Sidley, Bexhill, Sussex, H. L. GREEN; Lerwick, Shetland, DRUCE. Doubtless adventive.

†1792. S. PEREGRINUM Ledeb. Harlech, Merioneth, DRUCE & JONES; Virley, Essex, DRUCE; Beaminster, Dorset, GRAVESON; Linkness, Orkney, DRUCE.

†1797. Borago orientalis L. Near a stream at Cock Mill, near Ruswarp, Yorks. First noticed by the recorders in 1916, but it is stated to have been known there for 30 years; well established, F. Snowdon, ex Flintoff.

1813. Myosotis palustris Hill. Harlech, Merioneth, Druce & Jones. Probably of garden origin. Var. strigulosa (Reichb.). Near Uyea Sound, Unst, Druce. This, too, may be of garden origin, although looking native.

1821. M. lutea Pers. Melmerby, Cumberland, Rev. W. W. Mason.

1822. Lithospermum officinale L., var. pseudolatifolium Salm. Colesborne, Gloster, Greenwood.

†1830. Cerinthe minor L. Two and a half miles south of Corbridge-on-Tyne, Northumberland, on ground where trees had been felled, Temperley.

†1837. Cuscuta Epilinum DC. Ashwell and Newnham, Herts; Stondon, Beds, R. Long, ex Little.

†1846. Solanum nigrum L., var. luteo-virescens (Gmel.). Dry Sandford, Berks, Gambier-Parry.

†1849. S. triflorum Nuttall. On the sandy shore a little above high-water mark, Holy Island, Northumberland, Temperley.

†1855. Datura Stramonium L. Caldy Island, Pembroke, Arnett; very fine at Blackpill, Glamorgan, Webb. † Var. Tatula (L.). Meanwood, Leeds, Druce. The type abundant there and at Bradford.

†1860. Verbascum phlomoides L. Old camp ground, Swanage, Dorset, Miss Todd.

†1863. V. virgatum Stokes. Denham, Bucks, Redgrove.

†1864. V. Blattaria L. Felthorpe, E. Norfolk, Clarke.

*1867. V. nigrum L. Carmarthen, Hamer.

†1873 (4). LINARIA DALMATICA Mill. Field near Budleigh Salterton, Devon, Alderman GARDNER.

†1882. L. SUPINA Desf. Cosham, S. Hants, 1912, Mrs WEDGWOOD.

1884. L. SPURIA Mill, lusus PELORIA. Near Bourne St Mary, Hants, BOYS.

1892. SCROPHULARIA AQUATICA L., var. APPENDICULATA Mérat. Ippolyts Common, Herts, LITTLE; Stow Wood, Oxon, DRUCE. Var. CINEREA Dum. Purwell, Hitchin. Herts, LITTLE.

1893. S. ALATA Gilib. A form with less winged stem and less glossy foliage, York, G. WEBSTER. Needs further study.

†1899. MIMULUS MOSCHATUS Dougl. Wotton, Surrey, Mrs WEDGWOOD.

*1901. LIMOSELLA AQUATICA L., var. TENUIFOLIA Lej. Sides of the River Glaslyn in both counties, Carnarvon and Merioneth, in immense quantities, GAMBIER-PARRY and D. JONES. A very important comital addition since, till now, it has only been known as a native plant from Kenfig Pool, Glamorgan.

1906 (5). VERONICA TEUCRIUM L. In a field at Knockpatrick, Limerick. PRAEGER.

1911. V. BECCABUNGA L., var. REPENS Bosch. Twinstead, N. Essex, DRUCE.

1912. V. ANAGALLIS-AQUATICA L. Swanbister, Orkney; Dunrossness, Shetland, DRUCE. Var. GLANDULOSA Druce. Oughton Head, Hitchin, Herts, LITTLE.

1912 (2). V. AQUATICA Bernh. Snove Hall, W. Norfolk, LITTLE; Bradland Pond, Northants; Swainsthorpe E. (not W.), Norfolk, DRUCE. Var. MONTIOIDES (Boiss.) Druce. Cirencester, Gloster, GREENWOOD.

1919. V. ARVENSIS L., var. NANA Poir. Near Don Bridge, Jersey, 1921, DRUCE.

†*1923. V. TOURNEFORTII Gmel. Garden weed at Unst, Shetland, DRUCE.

1940 (3). EUPHRASIA CONFUSA Pugsley. Llangannock, Carmarthen, BRUNKER.

1948. BARTSIA ODONTITES L., var. VERNA (Reichb.). Swanbister, Orkney, DRUCE; Burren, Co. Clare, DRUCE. Var. LITORALIS (Reichb.). Dunrossness, Shetland, DRUCE. New to the Mainland.

1951. RHINANTHUS MAJOR Ehrh. Near Radlett, Hertford, Dr SALISBURY.

*1953. R. RUSTICULUS (Stern.) Druce. Arisaig, Westerness; Bettyhill, W. Sutherland, 1919, DRUCE.

1954. R. STENOPHYLLUS Schur. Baltasound, Spiggie, Shetland; Roundstone, Galway, DRUCE.

*1955. R. MONTICOLA Druce. Stenness, Orkney; Balta, Shetland, 1920, DRUCE.

1959. MELAMPYRUM ARVENSE L. Eartham, W. Sussex, BROCK.

*1960. M. PRATENSE L. Saxavord, Unst, at 750 ft., only one small specimen seen in flower, DRUCE.

1962. OROBANCHE RAPUM-GENISTAE Thuill. East Hoathly, Sussex, H. L. GREEN; on gorse near Harecroft, Cumberland, Lady EDINA AINSWORTH.

1971. O. MINOR Sm., var. FLAVESCENS Reut. On *Volvulus sepium*, near Port Eynon, Glamorgan, Miss PHOEBE SIMONS.

1976. UTRICULARIA MAJOR Schmidel. Pools on the shore, Muddiford, S. Hants, Miss TODD; East Hoathly, Sussex, H. L. GREEN; Loch of Fleet, new to Unst, DRUCE.

†1983. ACANTHUS MOLLIS L. Mule camp, on the downs, near Shoreham, Sussex, Miss COTTIS.

†1989. MENTHA ALOPECUROIDES Hull. Binstead, Isle of Wight, Mrs WEDGWOOD.

1990. M. LONGIFOLIA Huds. Near Basset, S. Hants, Miss TODD.

1996. × M. VERTICILLATA L., var. PALUDOSA (Sole). Shawford, S. Hants, RAYNER.

1997. × M. GENTILIS L. Swaythling, S. Hants, garden plant, RAYNER; Mallow, Co. Cork, 1921; Birdlip, Gloster, DRUCE; Felinfoel, Carmarthen, *Motley Hb.*

2000. M. ARVENSIS L., var. NUMMULARIIFOLIA (Sch. & Korte). Denham, Bucks, DRUCE; Harefield, Middlesex, DRUCE.

2004. ORIGANUM VULGARE L., var. ALBIFLORUM Lej. Gower, Glamorgan, WEBB.

†2031. SALVIA VERTICILLATA L. Radyr, Glamorgan, R. SMITH; Dunster, Somerset, G. TALBOT; Glasson Docks, Lancs, Miss M. COBBE.

2044. PRUNELLA VULGARIS L., sub-var. ALBA. An albino plant, with type, at Lowthorne, E. Yorks. An immense colony in newly cleared woodland, W. CRAIK.

†2059. STACHYS ANNUA L. Radyr, Glamorgan, R. SMITH.

2075. LAMIUM GALEOBDOLON Cr. Peloric form, Leigh Woods, N. Somerset, N. SANDWITH.

2082. TEUCRIUM CHAMAEDRYS L. In a lane near Penzance, Cornwall, THURSTON.

2083. AJUGA REPTANS L. A scionless form on Carnedd Dafydd, Carnarvon, June 1921. Perhaps Johnson's plant (see *Merc. Bot.*, pars alt. ii., 1641) was this form, DRUCE.

2090. PLANTAGO CORONOPUS L., var. PYGMAEA Lange. Merthyr-Mawr dunes, Glamorgan, WEBB.

2092. P. LANCEOLATA L. With dense, compound heads at Hayling Island, S. Hants, Miss HILLARD; Godshill, Isle of Wight, STRATTON. Var. DECUMBENS Rostr. Roundstone, Galway, DRUCE. Var. SPHAEROSTACHYA Roehl. With considerable wool at leaf-bases [Ref. No. 1879], East Mersea, Essex, BROWN.

†2100. P. ARISTATA Mich. N. Queensferry, Fife, TEMPLEMAN.

2102. ILLECEBRUM VERTICILLATUM L. Mouth of the River Meon, S. Hants, Miss HILLARD.

†2110. AMARANTHUS RETROFLEXUS L., var. DELILEI Thell. Hertford, 1846, ANSELL.

2120. CHENOPODIUM HYBRIDUM L. Winchester, Miss TODD.

2121. C. URBICUM L. Bradford, Yorks, CRYER; Berwick, A. H. EVANS.

2122. C. MURALE L., var. MICROPHYLLUM Gurke. Exmouth, S. Devon, Miss TODD; Hertford, GRAVESON.

2123. C. OPULIFOLIUM Schrad. Radyr, Glamorgan, SMITH; Gloucester Docks, GAMBIER-PARRY. C. OPULIFOLIUM × ALBUM = × C. PREISMANNI Murr. Cirencester, Gloster, W. J. GREENWOOD.

2124. C. LANCEOLATIFORME Murr. A conspicuous, tall plant with entire, lanceolate leaves, Bradford, Yorks, September 1921, and a form with long, mucronate leaves at Botley, Oxon, DRUCE.

2124. C. VIRIDE × ALBUM. With subfastigiate inflorescence [Ref. No. Y896], Bradford, Yorks, DRUCE.

2124. C. PAUCIDENS Murr (*album* × *viride*). E. Bergholt, Suffolk [Ref. No. 1777], BROWN; Bradford, Yorks [Ref. No. Y986), September 1921, DRUCE; Swanage, Dorset, C. B. GREEN; Glasgow, 1921, GRIERSON; Radyr, Glamorgan, SMITH.

2124. C. SUBFICIFOLIUM Murr, as a sub-sp. of *album*. Swanage, Dorset, C. B. GREEN; Bradford, Yorks, CRYER. Dr Murr thus names the plant and cancels the var. *borbasiforme* to which I referred it.

2124. C. PSEUDO-STRIATUM Zschacke. Bradford, Yorks, September 1921, CRYER & DRUCE.

2124 (5). C. LANCEOLATUM Muhl. Bradford, Yorks, September 1921, CRYER & DRUCE.

2125. C. LEPTOPHYLLUM Nutt. Barry, Glamorgan. SMITH.

2126. C. FICIFOLIUM Sm. Hitchin, Herts, LITTLE. This corroborates the name in *Rep. B.E.C.* 158, 1914.

2127. C. GLAUCUM L. In a field at Falconhurst, Edenbridge, Kent, G. TALBOT. A curious, untypical form, thus named by Dr Murr. Also from Sowley Pond, S. Hants, Miss TODD.

2129. C. POLYSPERMUM L. Grovebury sandpit, near Billington Crossing, Beds, 1920, A. TEMPLEMAN. A very dwarf form. Var. CYMOSUM Moq. North Cadby, Somerset, BOYS.

†2130. C. AMBROSIOIDES L. Bradford, Yorks, CRYER & DRUCE.

†2130 (3). C. PANICULATUM Hook. Bradford, Yorks, 1919, CRYER. Dr Murr corroborates Dr Thellung in thus naming it.

†2131. C. STRIATUM (Kras) Murr, f. EROSA. With very compact inflorescence, Baptist Mills, Bristol, October 1920, Miss TODD.

†2131. C. SUBSTRIATUM Murr = C. STRIATUM × ALBUM, ad PRAEACUTUM vergens. Another conspicuous Goosefoot, growing at Bradford, Yorks, September 1921, DRUCE & CRYER: Abingdon, Berks, 1917, DRUCE.

†2131 (3). C. HIRCINUM Schrad. Bradford, Yorks, CRYER & DRUCE: Leith, FRASER.

†2131 (4). C. BERLANDIERII Moq. Hythe Quay, N. Essex [Ref. No. 177], BROWN. Near to this is a plant from Winchester, Miss TODD.

†2134. C. VIRGATUM Ambrosi. Cambridge, H. CARTER: Phillach sand dunes, Cornwall, E. THURSTON.

†2135. Roubieva multifida Moq. Radyr, Glamorgan, Smith; Uxbridge, Middlesex, Mrs Wedgwood.

2148. Atriplex deltoidea Bab. Compton, Beds, Little.

†2153 (2). Axyris amarantoides L. Reigate, Surrey, H. E. Girdlestone; Scarborough, Yorks, A. H. Alston.

*2157. Salicornia lignosa Woods. Near Cardiff, Glamorgan, Miss Vachell.

2176. Polygonum tomentosum Schrank (*maculatum*). *Burridge Health Farm, Gt Bedwyn, S. Wilts, C. P. Hurst; Fordham, W. Norfolk, Little; Llanarthney, Carmarthen, Hamer.

*2178. P. mite Schrank. Pembrey, Carmarthen, Hamer.

†2190 (2). P. polystachium Wall. Cocklington, S. Devon, Miss Todd.

†2191. P. cuspidatum S. & Z. Bexhill, &c., Sussex; Fulham, Middlesex, Green; Fort William, Westerness, Webb.

2195. Rumex Hydrolapathium Huds., var. latifolius (Borr.). Near Wareham, Dorset, Miss Todd; Welshpool, Montgomery, Druce. A plant from Chew Magna collected by Mrs Thatcher is perhaps best placed here.

× 2198. R. propinquus Aresch. Langdon Beck, Teesdale, Miss M. Cobbe.

2207. R. maritimus L. Highnam, W. Gloster, Gambier-Parry; Cirencester, Gloster, Greenwood; Scoulton, Norfolk, Miss Cobbe.

†2210 (6). R. salicifolius Weinm. Chipping Norton, Oxon, Druce; Slateford, Midlothian, Fraser; Uxbridge, Middlesex, Lady Davy.

+2210 (12). R. magellanicus Gris. Seen at Leith for nearly 20 years, Fraser; Phillack sand dunes, Cornwall, near a mule camp, Thurston.

*2214. DAPHNE LAUREOLA L. Near St Peter's, Guernsey, on a high wall with earth, not planted, W. H. JONES.

2215. D. MEZEREUM L. Still at Kettlewell, Yorks, Miss COBBE.

2223. EUPHORBIA PLATYPHYLLOS L. Stone, Kent, ST J. MARRIOTT.

*2227. E. AMYGDALOIDES L. Wood, near Ystradfellte, Brecon, B. A. WILLIAMS.

2243. MERCURIALIS AMBIGUA L. f. Near Winchester, Miss TODD.

2246. ULMUS PLOTII Druce. Shrewsbury, Shropshire; Tewkesbury, W. Gloster; Mallow, Cork, DRUCE.

†2248. CANNABIS SATIVA L. Near Leicester, 10 feet high, in an orchard, MARTIN.

2258. ALNUS GLUTINOSA Gaertn., var. MACROCARPA Loudon. Ballyhalis, Kerry, DRUCE; the type near Hitchin, Herts, less common than var. *macrocarpa*, LITTLE.

2259. CARPINUS BETULA L. In a hedge near Great Horwood, Bucks, F. W. HEWLETT.

†2264. QUERCUS ILEX L. Seedlings on Caswell Cliffs, Glamorgan, WEBB.

2270. SALIX HOFFMANNIANA Sm. ♀ Plentiful at Shalbourne, S. Wilts, and one tree ♀ at Great Bedwyn, N. Wilts, HURST.

×2273. S. ACUMINATA Sm. Ickleford, Herts, LITTLE.

2289. POPULUS CANESCENS Sm. Near Welshpool, Montgomery, DRUCE.

†2291. P. NIGRA L. Ludlow, Salop; Welshpool, Montgomery, DRUCE.

2299. HYDROCHARIS MORSUS-RANAE L. Pond at Redcoats Green, Herts, perhaps introduced by water birds, LITTLE.

2306. Listera cordata Br. Teesdale, Durham, Miss M. Cobbe.

*2309. Spiranthes Romanzoffiana Cham. In a bog near Waterville, Kerry, P. MacSweeney in *Irish Nat.* 79, 1921. R. W. Scully suggests that the south and north Irish plants differ slightly.

*2313. Cephalanthera Damasonium Druce. Beech wood on chalk near Brough, E. Yorks, 1920-21, Miss Burnett, ex W. S. Bisat and J. Fraser Robinson. An important extension of its range northwards.

2323. Orchis ustulata L. Pointon, near Billingbro, Lincoln, Miss Landon.

2324. O. morio L., forma Churchillii Druce. Ramsden Heath; Stanton St John, Oxford, Druce; Cuckfield, Sussex, Lady Davy.

2325. O. latifolia L. Professor Lindman kindly sent me specimens from wet meadows, Scania, Sweden, which resemble the Swiss plants from Aarau, Switzerland, supplied by Dr Keller. They differ from any British plant yet seen by me. The " *latifolia* " from Arran sent by Dr Stephenson is a slender plant with narrow leaves, and to me is a *maculata* hybrid.

2326. O. incarnata L. Christchurch, S. Hants, R. V. Sherrin. Var. dunensis Druce. Marshy loch side, Kierfold, Sandwick, Orkney, 1921, Johnston. Seen in Orkney in 1920, Druce.

2326 (2). O. praetermissa Druce. Woodbury Common, Halberton, Tiverton, S. Devon, robust plants over 2 feet high, D'Urban; Cirencester, Gloster, Greenwood; typical, Cobham, Surrey, L. G. Payne; Harlech, Merioneth; *Sligachan, Skye; *Strath Carron, W. Ross; *Blair Athol, E. Perth; *Lerwick, Shetland, Druce. Var. pulchella Druce. Stoborough, Miss I. M. Roper; Wareham, Dorset, R. V. Sherrin; Arran, Stephenson; Teesdale, Durham; Walton, Caithness; Inchnadamph, W. Sutherland; Invershin, E. Sutherland; Sligachan, Skye; Strathpeffer, E. Ross; Balta, Burrafirth, Unst; Tingwall, Whiteness, Dunrossness, Shetland; Woodford, Galway, Druce. × maculata. Harlech, Merioneth, Druce. × Fuchsii. Near Cobham, Surrey, L. G. Payne; Sligachan, Skye, Druce.

2326 (3). O. PURPURELLA Steph. Kirkby, 69b, PEARSALL; *Kirbister, Syradale, Orkney; *Lerwick, Balta, Shetland; *Strathpeffer, E. Ross; Llanganeth, Glamorgan; Tremadoc, Carnarvon; Watendlath, Cumberland, DRUCE; Keirfold, Orkney, 1921, Ref. No. 1147, JOHNSTON; Arran, STEPHENSON. × LATIFOLIA. Arran, STEPHENSON. × HABENARIA GYMNADENIA. Arran, STEPHENSON.

2327. O. MACULATA L., var. MACROGLOSSA Druce. Harlech, Merioneth, DRUCE. × PRAETERMISSA, var. PULCHELLA. Syradale, Kirbister, Orkney, 1920; Tingwall, Spiggie, Shetland, DRUCE. × HABENARIA GYMNADENIA. Arran, STEPHENSON; forest of Rowland. York, J. A. PICKARD.

2327 (2). O. FUCHSII Druce. Cobham, Surrey, L. G. PAYNE; Woodbury Common, S. Devon, thirty inches high, D'URBAN. × MACULATA = O. TRANSIENS Druce. Cobham, Surrey, L. G. Payne.

2327 (3). O. O'KELLYI Druce. Ditchling, Sussex, L. G. PAYNE; Glenasmole, Dublin, PRAEGER.

2329. O. MASCULA L. Near Tenby, Pembroke, and near Malvern, Worcester, TOWNDROW & WALL; leaves unspotted, labellum less cut, flower deep colour, Cwm Idwal, Carnarvon, DALTRY.

*2331. O. HIRCINA Crantz. Near Lollingdon, Berks, Misses STEPHENS and WELLS, ex Miss NEILD; Hinxton, Cambridge, A. SHRUBBE, ex A. H. EVANS. Splendid new county records. *Hircina* flowered well in Jersey, Kent, Gloster, and Sussex this year.

2335. OPHRYS APIFERA Huds., var. CHLORANTHA Heer. Eastbourne, Sussex, HAYNES.

2335 (2). O. TROLLII Heget. Andoversford, Mr HEMPIDGE, ex Miss VACHELL; Highnam, Gloster, GAMBIER-PARRY.

*2336. O. MUSCIFERA Huds. Killiecrankie Pass, E. Perth, J. PICKARD.

2343. HABENARIA VIRESCENS Druce, var. ECALCARATA. Wittenham Wood, Berks, HAYNES.

†2363 (2). TRITONIA CROCOSMIFLORA Nich. On rubbish, Chipping Norton, Oxon; by the Roughty River near Dromidnagower, Kerry, far from houses, September 1921, DRUCE; Blackpill, etc., Glamorgan; Arisaig, Westerness, WEBB; shores of the Clyde at Whiting Bay, Tighnabruaich, GRIERSON.

2364. NARCISSUS LOBULARIS Haworth. Mr J. ARNETT sent me fresh specimens on March 2, 1921, from the vicinity of Tenby, Pembroke, of the single and also the flore pleno variety.

*2382. RUSCUS ACULEATUS L. Near Carmarthen, HAMER.

†2390. ASPHODELUS FISTULOSUS L. Portishead Dock, N. Somerset, GAMBIER-PARRY; Eltham, Kent, Mrs WEDGWOOD; Glasson, Lancs; Exmouth, Devon, Miss A. B. COBBE.

2396. ALLIUM VINEALE L., var. BULBIFERUM Syme. Bexhill, Sussex, H. L. GREEN. Var. COMPACTUM (Thuill.). The only form about Hitchin, Herts, LITTLE.

†*2405. A. SCHOENOPRASUM L. Hayling Island, S. Hants, Miss HILLARD.

2410. SCILLA AUTUMNALIS Huds. In thousands this year near Hampton Court, Lady DAVY; on Blackheath, Kent, 1920, Miss BACON. It is very pleasing to find this much threatened species still growing in the vicinity of the metropolis.

2411. S. NONSCRIPTA L. & H., var. BRACTEATA Druce. Midsomer Norton, Somerset, Mrs TUNNICLIFF, ex Mrs THATCHER.

2420. GAGEA LUTEA Ker-Gawl. At 1125 feet in Colt Park Wood, Ribblehead, York, C. A. CHEETHAM in *Naturalist* 168, 1921.

2422. COLCHICUM AUTUMNALE L., var. VERNALE.' Silligrove, Wyre Forest, Worcester, Miss M. AMOS, ex H. POWELL.

2425. PARIS QUADRIFOLIA L. A six-leaved form at Coedriglan, Glamorgan, R. SMITH.

2434. JUNCUS SYLVATICUS Reich. Attacked with the gall, *Livia juncorum*, Killin, M. Perth, FRASER.

2441. J. TENUIS Willd. Ardlui, Dumbarton, *Glasgow Nat.* 103. 1915. There is a Perthshire specimen collected by M'Intyre before 1844 in *Herb. Ansell.*

*2466. SPARGANIUM MINIMUM Fr. Llanaber, Merioneth, DRUCE.

*2478. ELISMA NATANS Buch. Cwm Bychan Lake, Merioneth, GAMBIER-PARRY.

2528. CYPERUS FUSCUS L. It has re-appeared at Dorney, Bucks, in small quantity, DRUCE and Miss BARBARA BUCKLER; most abundant this year near Clevedon, N. Somerset, Mrs SANDWITH.

2530. ELEOCHARIS MULTICAULIS Sm. Sligachan, Skye, DRUCE.

*2531. E. ACICULARIS Br. Welshpool, Montgomery, DRUCE.

*2540. SCIRPUS NANUS Spreng. On the banks of the Glaslyn River, Merioneth, DRUCE, JONES, & GAMBIER-PARRY. In considerable quantity, Mr Parry says, with *Eleocharis acicularis*, *Scirpus setaceus* and *Savii*.

2549. ERIOPHORUM GRACILE Roth. Aldershot, Hants, TEMPLEMAN.

2558. CAREX PSEUDOCYPERUS L. Near Welbeck, Notts, GOULDING; *Singleton Bog, Glamorgan, WEBB.

*2559. C. RIPARIA Cust. Carmarthen, BARKER.

2576. C. FLAVA L., var. OEDOCARPA And. Llanaber, Merioneth, DRUCE.

2576. C. LEPIDOCARPA Tausch. Hoy, Orkney, DRUCE. × FULVA. Simonsbath, S. Somerset, Lady DAVY; above Tan-y-Bwlch, Carnarvon, Miss COBBE.

2604. C. GOODENOWII Gay, var. RECTA A. & G. Llanaber, Merioneth, DRUCE.

*2617. C. PANICULATA L. Llanaber, Merioneth, DRUCE; Pamplin also saw it near Llanderfel. Var. PSEUDO-PARADOXA Gibs. Oughton Head, Hitchin, Herts, LITTLE.

2621. C. INCURVA Lightf. Near Spiggie, Shetland, DRUCE.

2627. C. PAUCIFLORA Lightf. Eskdale, Cumberland, an extension of its range in the county, and its second locality 40 miles apart, R. H. WILLIAMSON.

†2634. PANICUM SANGUINALE L. Grange-over-Sands, Lancs, Miss A. B. COBBE.

†2637. P. LAEVIFOLIUM Hack. Maryborough Camp, Glasgow, GRIERSON; Bradford, York, CRYER, as the var. *amboense* Hackel.

†2650. PHALARIS AQUATICA L. Bowling Coup, Glasgow, GRIERSON.

*2670. MILIUM EFFUSUM L. Porth-yr-Ogof, Brecon, WEBB.

2678. PHLEUM ARENARIUM L. Gloucester Dock, GAMBIER-PARRY.

*2706. AIRA CARYOPHYLLEA L. On shale cliff near Scalloway, Shetland, native. Beeby only saw a solitary specimen in cultivated ground, DRUCE. Var. MULTICULMIS (Dum.). Benston, Herts, LITTLE.

2717. AVENA FATUA L., var. PILOSISSIMA Gray. Mr Marquand, who has been specialising on Oats, has kindly examined my Herbarium. The following localities have afforded specimens which he puts under Gray's variety. St Luke's, Jersey; Falmouth, Cornwall; Staplehurst, Kent (E. S. MARSHALL); Claygate, Surrey (H. C. WATSON); Yiewsley, Middlesex; Bengoe, Herts, 1853 (ANSELL); Amersham, Slough, Bucks; Hermitage, &c., Berks; Bullingdon, Banbury, &c., Oxon; Warboys, Cambridge (FRYER); Pilning (J. W. WHITE); St Philip's Marsh, W. Gloster; Lighthorne, Warwick, 1855 (C. E. PALMER); Portmadoc, Carnarvon; Watton, Norfolk; Yardley Gobion, Harp le, &c., Northants; Chesterfield, Derby (DRABBLE). Var. GLABRATA (Peterm.). Staines, Harefield, Middlesex; Wytham, Berks; Slough, Bucks; Galashiels, Selkirk.

†2721. A. ORIENTALIS Schreber. Odiham, Hants, 1889, Miss C. E. PALMER.

2733. PHRAGMITES VULGARIS (Lam.) Druce, var. STOLONIFERA (Mey.). Lyme Regis, Dorset, Miss A. B. COBBE. Var. FLAVESCENS (Cust.). Erith, Kent; Mallow, Cork; Limerick; Killarney, Kerry; Wexford, DRUCE. Var. EFFUSA (A. & G.). Radley, Berks; Greenhithe, Kent, DRUCE.

*2746. CATABROSA AQUATICA Beauv. Carmarthen, BARKER.

2759. POA PRATENSIS L., var. LATIFOLIA Weihe. Hoy, Orkney, 1920; Marlborough, Wilts, a very robust plant. DRUCE. Var. ANGUSTIFOLIA (L.). Chichester, Sussex, DRUCE.

*2759 (2). P. IRRIGATA Lindm. Burrafirth, Unst, Shetland, DRUCE.

†2760. P. PALUSTRIS L. Uxbridge, Middlesex, Lady DAVY. Adventive here as elsewhere in Britain.

2761. P. TRIVIALIS L., var. RIGIDIOR Rupr. Winter Corrie, Clova, Forfar, DRUCE. Var. GLABRA Doell. Stone Marshes, Kent, ST J. MARRIOTT.

*2773. GLYCERIA PLICATA Fr. Welshpool, Montgomery, DRUCE.

2783. FESTUCA SYLVATICA Vill. Below Einon Gam Fall, Glamorgan, WEBB. Spec. non vidi.

†2803. BROMUS UNIOLOIDES H.B.K. Gloster Docks, GAMBIER-PARRY; Swaythling, S. Hants, RAYNER; Hayes, Kent, Mrs WEDGWOOD.

†2806. B. SECALINUS L. The short spikeletted form. Between Wareham and Wool, Dorset, Miss TODD; Glasgow, GRIERSON.

*2807. B. COMMUTATUS Schrad. Llanelly, Carmarthen, *Hb. Motley*.

†2815. B. MACROSTACHYS Desf. Woolwich, Kent, C. H. GRINLING.

†2817. B. JAPONICUS Thunb. Hampstead, Middlesex, Mrs WEDGWOOD.

2824. LOLIUM PERENNE L., var. SPHAEROSTACHYUM Masters. Aberystwyth, Cardigan, MARQUAND.

2827. AGROPYRON REPENS × JUNCEUM (*A. Hackelii* Druce). Muddiford, S. Hants, Miss TODD.

*2872. EQUISETUM HYEMALE L. Fairlight Glen, Sussex, 1914, REDGROVE. A very interesting record.

2896. DRYOPTERIS REMOTA Braun. A single clump in the wood, Dalystone, Galway, PRAEGER. One would value Mr Stansfeld's opinion on this.

2898. D. SPINULOSA Kuntze. Oughton Head, Herts, LITTLE.

2899. D. ARISTATA Druce, var. ALPINA (Moore). Scuir Ouran, W. Ross, 1883; Cairngorm, Easterness, 1920, DRUCE.

2911. CETERACH OFFICINARUM DC., var. CRENATUM Milde. Llangendeirne, Carmarthen, BARKER.

†2923. AZOLLA FILICULOIDES Lam. Monkton, Kent, Lady DAVY and Miss VIVIAN.

*2936. NITELLA TRANSLUCENS Ag. Bardister, Shetland, DRUCE.

*2943 (2). TOLYPELLA NIDIFICA Leonh. Loch of Huesbreck, Shetland, DRUCE.

*2950. CHARA CONTRARIA Br. With the foregoing, DRUCE.

2958 (2). C. DELICATULA Gr. & Webst. Wareham, Dorset, Miss TODD; Roundstone, Galway; Sligachan, Skye, DRUCE.

ADVENTIVE PLANTS OF THE GLASGOW AREA. 1921.

In the Counties of Renfrew (R.), Lanark (L.), and Dunbarton (D.).

By R. Grierson.

224. *Brassica incana* Schultz, Riddings (L.). 239. *Lepidium perfoliatum* L., Maryburgh (L.), Cumbernauld (D.). 247 (4). *L. densiflorum* Schrad. 247 (31). *L. ramosissimum* A. Nels. 268. *Rapistrum rugosum* All., Riddings (L.). Newlands (L.), Dumbarton. 324. *Dianthus Caryophyllus* L., hortal, Tollcross (L.). 328. *Gypsophila paniculata* L., Maryburgh (L.). 330 (2). *G. elegans* Bieb. 356. *Silene annulata* Fenzl, Riddings (L.). 562. *Medicago Falcata* L., Gartcosh (L.). 610. *Trifolium stellatum* L., Dalmuir (D.). 651. *Galega officinalis* L., Bowling (D.). 685. *Vicia monanthos* Desf., Bowling (D.). 727. *Lathyrus odoratus* L., hortal, Tollcross (L.). 1107 (2). *Carum aromaticum* Druce (*copticum*), Maryburgh (L.). 1297. *Rudbeckia laciniata* L., Newlands (L.). 1301. *Helianthus annuus* L. 1306. *Guizotia abyssinica* Cass., Ibrox, etc. (L.). 1313. *Hemizonia pungens* T. & G., Possil (L.), Maryburgh (L.), Dalmuir (D.). 1338. *Anthemis tinctoria* L., Maryburgh (L.). 1489. *Picris Hieracioides* L., Ibrox (L.). 1777 (6). *Nemophila insignis* Benth., Maryburgh (L.). 1878. *Linaria repens* Mill., Gartcosh (L.). 1879. *L. chalepensis* Mill., var. *cleistogama* (Thell.). (L.). 2135. *Monolepis trifida* Schrad., Maryburgh (L.). 2168. *Salsola Kali* L., var. *tenuifolia* (Mey.). Possil (L.). 2114 (2). *Amaranthus Dinteri* Schinz, var. *uncinatus* Thell., Bowling (D.). 2111 (4). *A. quitense* H. B. K. 2210 (13). *Rumex paraguayensis* Par., Possil (L.). 2632. *Panicum Crus-galli* L., var. *longiaristatum* Lej., Newlands (L.). 2636. *P. miliaceum* L., Newlands (L.). 2640. *Setaria glauca* Beauv., Bowling (D.), Newlands (L.). 2649. *Phalaris tuberosa* L., Bowling (D.). 2650 (2). *P. truncata* Guss., Bowling (D.). 2698. *Gastridium ventricosum* S. & T., Ibrox (L.). 2718 (2). *Avena sterilis* L., Dalmuir (D.). 2792. *Festuca Myuros* L., Ibrox (L.). 2794. *Bromus villosus* Forsk. = *B. rigens* L. 2854 (2). *Hordeum trifurcatum* Jacq., Ibrox (L.).

ADVENTIVE PLANTS OF THE DUBLIN AREA, 1921.

By R. Grierson.

224. *Brassica incana* Schultz. 228. *Eruca sativa* Mill. 267. *Rapistrum orientale* DC. 1357. *Chrysanthemum coronarium* L. 1462. *Centaurea Solstitialis* L., Ballsbridge. 1463. *C. melitensis* L. 1789 (3). *Benthamia* (*Amsinckia*) *lycopsioides* Lindl. 1789 (5). *B. intermedia* Druce. 2639. *Setaria viridis* Beauv. 2640. *S. glauca* Beauv. 2803. *Bromus unioloides* H.B.K.

BRITISH CENTAUREAS OF THE NIGRA GROUP.

By C. E. Britton.

The following represents an attempt at an arrangement of the chief plant forms that pass in Britain under the name of *Centaurea nigra*. All botanists who have interested themselves in these plants are well acquainted with the diversity of forms met with, and of the difficulty that exists in assessing the correct value of the variations encountered. What has chiefly appealed to observers are the variations exhibited by (1) the phyllary-appendages, (2) the florets, (3) the fruits; other parts of the plants receiving less attention.

The *phyllary-appendages*.—In all members of the *nigra* series the appendages should be deeply pectinated with long more or less regularly-shaped teeth, equalling the disk-like undivided portion, or more usually exceeding the diameter of this in varying degrees to as much as four or five times. It is when the teeth bear a smaller relation to the disk, are less filiform, and variously united, that there may be a disposition to connect the plants showing such divergences with plant-forms outside the series of *nigra*.

The *florets*.—Usually these are uniform in the group of *nigra*, whereas in most species of the genus *Centaurea* it is the rule for the outer series to be much enlarged, of a shape different from the inner florets, and to collectively form a showy "ray."

The *fruits*.—Normally these are surmounted by a bristly or scale-like pappus. Frequently, however, no pappus is developed and when this condition is accompanied by one or both of the variations of the appendages and florets alluded to, such forms have been referred to *C. nigrescens* Willd., *C. serotina* Bor., *C. decipiens* Thuill., and *C. pratensis* Thuill., their real relationship being overlooked.

In general, I think it will be recognised that variation among the plants of this group is greater in Britain than on the Continent. With respect to the rayed forms which appear to be always rare on the Continent, these are singularly ill-distributed in this country, being in some localities of extreme rarity, in others so abundant as to constitute dominant forms. The property of producing radiant marginal florets seems inherent in the genus and is, no doubt, a latent character in the group of *nigra*, being called into existence by local conditions of exposure, elevation, &c. Some authors place great value upon the presence of radiant florets and absence of pappus, but, in the present group, these features appear to the writer to be of the nature of biological characters of little taxonomic importance, for in plants otherwise identical the florets may be radiant or not, and the fruits devoid of pappus or provided in varying degrees with this latter. It is quite certain, as experience in the field shows, that the arrangement adopted by Mr F. N. Williams (*Prodr. Fl. Brit.* i., 57-60), which would refer to *C. nigra* the pappose-fruited forms, and to *C. Jacea* those deficient of pappus, is hardly in accordance with the facts.

CENTAUREA NIGRA L.

Whether it is possible to use this name other than in an aggregate sense is doubtful. When looking through the Linnean Herbarium no type specimen was seen : all that bore on the matter was a specimen, without data of any kind, that Dr Daydon Jackson informed me was grown in the garden at Upsala as the Linnean species. The opinion of Jordan that the name covered many different plants is probably correct and is here adopted, although it must be admitted that later French botanists regard *C. nigra* L. as synonymous with *C. obscura* Jord.

C. OBSCURA Jord. in Schultz Arch. Fl. Fr. et D'Allemagne, p. 320.

It is rather curious that the author of the name, contrary to his usual practice, published no long and detailed description.

After discussing the question of the applicability of the Linnean name, and arriving at the conclusion before-mentioned, Jordan stated that he applied the name *C. obscura* to the species formerly named by him *C. nigra*, and particularised it in the following words :" C'est une plante de prairies montueses, plus basse et moins multiflore que le *C. nemoralis* Jord., à capitules plus gros, à involucres plus noirâtres, fleurissant dans un même lieu, près de deux mois avant cette dernière espèce qui habite surtout les bois de la plaine." The importance attached to the habit and season of flowering is well-founded, as contrasted with *C. nemoralis*, and inspection of plants distributed by Jordan as his *obscura* show a close agreement with the short description. These plants have usually unlobed lanceolate leaves, stems simple or with few undivided branches with terminal globose capituli, appendages dark brownish-black, with the central disk triangular-lanceolate or even lanceolate. Some authors ascribe to the appendages a broader outline than the type-specimens allow; for instance, Boreau described them as very broadly ovate; Grenier (*Fl. Jurass.*) said that they were much broader than long; whilst Gugler described the disk as broadly-ovate to roundish or even reniform. It is quite certain that *C. obscura*, as defined by Jordan and exemplified by his authentic specimens, is by no means a rare plant in Britain, occurring from the south to the extreme north (*C. nigra* L. from Sand Voe, Shetlands, 4/7/1889, W. H. Beeby, in Herb. S. Lond. Bot. Inst., appears to be undeveloped *C. obscura*). Just as on the Continent, it is difficult at times to draw a rigid line separating *C. obscura* from *C. nemoralis*, so similar uncertainties are occasionally presented by British plants, but bearing in mind the habit, the branches few and usually short, the roundish, usually dark-coloured heads, the early season (June) at which it commences to flower, there should be no difficulty in its recognition. British forms which cannot be kept apart from *C. obscura* may be as tall and as much branched as the most luxuriant form of *C. nemoralis*; the capituli may range in colour through all shades of brown to black; the appendages may be closely appressed or more or less spreading, and the pectination may be coarse. Among others, the following forms appear worthy of recognition.

Forma *longiflora*.—Florets much exserted, equalling the length of the pericline, the outer bent at right angles, sometimes doubly curved, about 28 mm. long; stamens of outer florets devoid of anthers; style and stigma well-developed; fruit epappose. This when growing is a plant with very conspicuous, bright crimson-purple florets which are pseudo-radiate, or sub-radiate, and has frequently attracted the attention of collectors. It is apparently referred to by Syme in *English Botany* v., 32, where he notes "another form has all the florets elongated or several rows of them elongated, but is destitute of the elongated trumpet-shaped ray." Surrey, Middlesex (cultivated examples distributed Bot. Exch. Club, 1921, under Ref. No. 1822), etc.

Forma *radiata*.—Outer florets radiate. This appears to be less frequent than the analogous form of *C. nemoralis*. Specimens placed here were distributed by Mr R. S. Standen from Burley Street, New Forest, Hants, 1913, through the Watson. Exch. Club, and by Rev. W. R. Linton from Cwm Bychan, Merioneth, 1895, through the Bot. Exch. Club. Specimens have also been seen from Devon, Aberdeen, etc.

Forma *pinnatifida*. — Leaves oblong - lanceolate, obtuse or acuminate-pinnatifid; lobes prominent, broadly triangular, or at lowest part of lamina lanceolate-acuminate. Has the habit of *C. obscura*, the stem with two or three branches each bearing a solitary capitulum. Surrey—Headley. Edinburgh—Pentland Hills, 1921 (Miss I. M. Roper).

Forma *elongata*.—Stem branched from or below the middle, lower branches 20-30 cm. long or more, often exceeding the main stem, simple or again branched. Stem-leaves lanceolate or oblong, entire or somewhat pinnatifid; rameal-leaves linear-lanceolate, entire or serrate-pinnatifid. Sometimes form luxuriant, much-branched plants about 3 feet high. Surrey, in several localities. Forfarshire (G. C. Druce), etc.

Var. *subnemoralis*, var. nov.—Stem reaching 7-8 dm., leafy, branched above; branches erect, the lower elongated. Stem-leaves linear-oblanceolate, entire or shallowly dentate-serrate, or oblong-oblanceolate, sinuate-pinnatifid. Capituli globose, umbilicate at base; appendages blackish-brown or black (teeth brownish), closely imbricate, or spaced, and then allowing the green phyllaries to be visible, spreading or spreading-recurved at lower part of capitulum; disks of lowest series subulate or narrowly lanceolate, succeeding series lanceolate-triangular to deltoid, uppermost roundish. Distinguished by narrow elongated leaves (lowest about 14 × 2.5 cm.) and narrow spreading or recurved basal appendages. Radnor—rocky banks of R. Wye at Boughrood (W. C. Barton) [Ref. No. 478], distributed through Bot. Exch. Club 1920). Surrey—Ockham (cultivated plants distributed under No. 2209 through Bot. Exch. Club 1921).

Forma *longiflora*.—Florets as in *C. obscura*, f. *longiflora*. S. Lincs.—Bourne (A. Webster).

CENTAUREA SURREJANA, sp. nov.

Stem erect, flexuose, simple or more usually branched; leaves scattered, subequal, the lower 10-16 cm. long, oblanceolate or elliptical-lanceolate, sinuate-pinnatifid or dentate, subacute, narrowed into petiole sometimes as long as lamina; the upper leaves oblong-lanceolate or lanceolate, entire or sub-pinnatifid, acute; rameal-leaves scattered, linear-lanceolate, entire, about 30 × 5 mm., occasionally numerous and involucrate at base of capitulum. Branches arising from base of stem or from the middle or extreme summit, erect or erect-spreading, simple or branched towards the extremity, the lower 10-21 cm. long, the upper very short, equalling length of capitulum or longer. Capitulum globose, before expansion globose-conical, solitary or geminate, medium, about 15 mm. or less in diameter, arachnoid at base. Involucre closely covered by brown or blackish appendages or less covered and yellowish phyllaries somewhat exposed; disks of lowest appendages narrowly lanceolate, or mid-series ovate or triangular, upper roundish, length of teeth about three times diameter of disk. Easily recognised in the sub-simple forms by habit, large scattered spaced leaves and solitary or geminate capituli; in the more branched forms by habit, spaced leaves, and stem and branches dividing towards the apices into short subequal secondary branches. Surrey—Leatherhead meadows, Epsom Downs, Chessington, Burgh Heath, etc. Mr C. C. Lacaita informs me that he is acquainted with this form and finds it puzzling.

CENTAUREA DRUCEI, sp. nov.

Stem erect, branched, branches erect-spreading, arising from base or middle of stem, more or less uniform, reaching 30 cm. or more. Stem-leaves, lower sub-petioled, spreading, oblong-lanceolate, acute or subacute, pinnatifid, upper sessile, rameal leaves oblong-lanceolate or linear-lanceolate, entire, spreading, acute, and like the upper sessile stem-leaves provided usually with two prominent linear-lanceolate stipuliform basal lobes. Capituli globose, solitary, becoming umbilicate at base, appendages brownish, rarely blackish, closely covering the phyllaries or not; disks ovate or roundish, seldom lanceolate, teeth about twice as long as diameter of disk. The characters specified readily separate this from *C. obscura* Jord. and from *C. nemoralis* Jord. it can be distinguished by the larger globose heads becoming umbilicate at base; the flowering branches more ascending and clothed with more numerous leaves which often spread widely or are recurved; the usually broader disks of the appendages with teeth shorter, closer together, and less neat-looking; the *substipuliform* basal lobes of the sessile leaves. The last-mentioned character is, I believe, more constant in this form than in any other known to me. It is a feature that has apparently escaped the attention of botanists in forms of the *nigra* series, but receives due mention in the descriptions of members of the *Jacea* series, *e.g.*, Grenier & Godron in their account of *C. amara* and *C. Jacea*; Rouy in the case of *C. pratensis*; and Briquet when describing *amara*, *Jacea*, and *pratensis*. In this connection, it is interesting to note that Mr C. C. Lacaita, who is familiar with this form on the Sussex Downs, regards it as intermediate between *C. nemoralis* Jord. and *C. pratensis* Thuill., and is of opinion that French botanists would determine it as the latter. *C. Drucei* is found on chalk downs and in meadows, etc., in Surrey, Sussex, Essex, and probably is frequent in England. It is named in compliment to Dr G. C. Druce, as a slight acknowledgment of the great assistance rendered, especially in placing at my disposal his extensive set of *Centaurea* and all his gatherings of recent years, among which are Essex examples of the form here specifically separated. As in the case of allied species, there are several notable forms.

Forma *radiata*.—Outer florets radiant. Apesdown, Isle of Wight, 1921, C. C. Lacaita, Ref. No. 291/21 (as *C. pratensis* forma).

Forma *subternuda*. — Appendages not closely imbricate, yellowish-green phyllaries much exposed, especially in the lower half of capitulum, disks chiefly ovate, dark-brown, teeth lighter brown. Twinstead, N. Essex, 1919 (G. C. Druce, Ref. No. 079). See *Rep. B.E.C.* 826, 1919.

Forma *gracilis*.—Leaves linear, entire, the lowest only pinnatifid. Surrey—Tadworth; Sussex—Downs near Brighton.

Forma *angustisquama*.—Appendages blackish, disks linear-lanceolate or lanceolate. Surrey—Lower Morden.

Forma *tomentosa*.—Leaves very hairy, stems especially clothed with woolly hairs and felted towards the apex. Surrey.

CENTAUREA NEMORALIS Jord. Pug. pl. nov.

From the description in the work cited, it is seen that the chief features of this are the tall, much branched stems, slender, erect-spreading branches, capituli roundish ovoid, appendages lanceolate, brown rather than black. Contrasting it with what at that time he regarded as *C. nigra* L., but afterwards distinguished as *C. obscura*, Jordan wrote that it differed by its later time of flowering (two months), the involucre much less globose in shape, brownish appendages, lanceolate and not broadly ovate, fruits narrower, stem taller with many more flower heads, branches slender and widely spreading. Taken as a whole these characters readily separate *C. nemoralis* from *C. obscura*. This is probably the most abundant member of the *nigra* group, at least in southern England, occurring in meadows and pastures on most soils, especially on the chalk, a formation avoided in general by *C. obscura*. As regards native forms there is greater diversity than is shown by its ally, and no rigid adherence to any one character mentioned by Jordan is possible. It appears likely that many forms growing in Britain are further apart from *C. obscura* than the type specimens of *C. nemoralis*. Such plants require further study. Noticeable features of British plants are the less rounded and more ovoid heads with the phyllaries frequently exposed by the spreading not appressed appendages which are perhaps less numerous. This deviation does not appear to justify the creation of a distinctive name, as these plants insensibly grade into others in which the appendages fully cover the phyllaries. Most of the

British plants may be arranged in two series according to the form of the leaves. It may seem a weak point to distinguish varieties on leaf-values only, but this course is adopted as the characters of the leaves seem more stable than any presented by the capituli and appendages, and to be independent of the water-content of the soil.

Var. *diversifolia*, var. nov.—Lowest stem-leaves oblanceolate, oblong-oblanceolate, or lanceolate, 12-18 × 2 cm., narrowed into petiole ½ to ⅓ their length, sinuate-dentate or sinuate-pinnatifid, acute; mid stem-leaves oblong-linear, pinnatifid, rameal leaves linear or linear-lanceolate, entire, acute, 2-4 × .5 cm. Frequently the broad elongated lower leaves are decayed at the flowering time, and then the abrupt change from the larger stem leaves to the narrow rameal leaves is usually sufficient to identify the variety. Common. Cultivated specimens coming under this (Ref. No. 2367) were distributed through Bot. Exch. Club, 1921.

Forma *consimilis*.—Appendages very pale brown or somewhat darker, teeth much lighter in colour. = *C. consimilis* Bor. Fl. du Centre, ed. 3, 351, but not all specimens so named by the author, as an example in Herb. Kew from Angers, 13 Juin, 1876, is, as noted by Mr C. C. Lacaita, only *C. obscura* Jord. Surrey, Wales, Ireland (Herb. Druce).

Forma *longiflora*.—Similar in character to the form of the same described under *C. obscura*. Surrey, Kent.

Forma *radiata*.—Capituli with marginal florets enlarged and rayed. In some localities of rare occurrence, in others, the usual form of the species, in which case observers are tempted to refer this to forms belonging to the *Jacea* cycle. Dr G. C. Druce's *C. nigra* L. var. from Lane End, Bucks, August 1921 (Ref. No. W.77) distributed through the Bot. Exchange Club, is placed here. It excellently illustrates the varietal characters.

Forma *latisquama*.—Disks of appendages broader, mostly roundish. W. Kent—Ifield.

Var. *subintegra*, var. nov.—Leaves broadly linear or lanceolate, entire, sub-entire, or the lowest serrate, seldom pinnatifid, usually exhibiting a complete transition from the lowest basal leaves to the upper rameal leaves. Surrey, Sussex, etc.

Forma *longiflora*.—Florets pseudo-radiate as in similarly named forms. Surrey, etc.

Forma *radiata*.—Marginal florets radiant. The remarks on var. *diversifolia*, f. *radiata* equally apply. Surrey, Sussex, etc.

Forma *decidua*.—Pericline with appendages partly or wholly falling away, leaving the greenish phyllaries almost wholly uncovered. Not an accidental state. W. Kent—Ifield, and elsewhere.

Var. *minima*, var. nov.—Dwarf plants 12 cm. or so in height, stems usually simple, basal leaves half as long as, or as long as, stems. Radical leaves lanceolate, elliptical-lanceolate, or ovate, sub-entire or sinuate-pinnatifid. Capituli small, appendages brown to blackish, sometimes very light in colour, often not wholly covering phyllaries, disks subulate, linear or lanceolate, rarely broader, teeth scarcely longer than breadth of disk, or twice as long. Heaths and exposed downs—Surrey, Sussex, Hants, etc.

Forma *radiata*.—Marginal florets rayed. In similar situations to the preceding, and has frequently been named *C. nigra*, var. *decipiens* (Thuill.) Bab.

Var. *microptilon* mihi = *C. microptilon* Gren. in Mem. Soc. libre d'emul. du Doubs, iii., 20-22 (1849); Gren. & Godr. Fl. Fr. ii., 243: *C. pratensis* Thuill., subsp. *C. microptilon* Rouy Fl. Fr. ix., 126; *C. nigrescens* Willd., subsp. *C. ramosa* Gugl., var. *microptilon* Gugl. The name *microptilon* was first used by Godron in Fl. Lorr. ii., 54, where under *Centaurea vulgaris* (a name equivalent to the whole *Jacea-nigra* series) is found var. "*microptilon* nob.," with the following diagnosis: "Appendices du pericline étroits, longuement subulés, planes, réfléchis au sommet, ciliés, écartés, et laissant voir les folioles." To this was referred *C. nigrescens*, var. *intermedia* Gaud. Fl. Helv. 5, 397, which is described by that author as having "Foliis lanceolatis integriusculis, calycibus subinde recurvatis pectinato-subplumosa." The British plants referred to this variety present the following characteristics. Stem about 45 cm., branched from below the middle, lower branches attaining a length of about 24 cm., the upper scarcely as long, usually exceeding the stem, all spreading or erect-spreading, usually simple. Lower leaves oblanceolate or linear-oblanceolate, sub-entire, dentate or dentate-pinnatifid, rameal leaves linear, entire. Capituli ovoid or conical-cylindrical, small, about 13 × 9 mm. before expansion, appendages not appressed, mostly subulate or linear-lanceolate, elongated, the upper part curved outwards, the lowest appendages spreading. The greenish or arachnoid phyllaries are conspicuous, and the arched character of the appendages is most noticeable before the expansion of the capitulum. Pappus entirely absent, represented by a few minute scales, or well-developed. Grenier described *C. microptilon* as being abundant in the neighbourhood of Nancy, and cited numerous other localities. Rouy states that it grows by roadsides and edges of woods nearly all over France with the exception of the north and south. In Britain hitherto recognised only in the south of England, where it appears scarce. Surrey, Sussex, Berks. First recorded in *Rep. B.E.C.* 506, 1918. With reference to the Berkshire plant there referred to (J. Ball, 1842, in Herb. Kew) it is interesting to note that this probably attracted the attention of Babington, as in 4th edition of the *Manual of Brit. Botany* (1856) he wrote, " A plant from Berkshire has patent or recurved lanceolate-attenuate appendages, no pappus, slender leaves, and differs otherwise. *C. microptilon* Godr?" In later editions of the *Manual* this note is deleted.

Forma *grizollensis*.—Outer florets of the capitulum rayed. Sussex (Herb. Lacaita), Oxon (Herb. Druce).

Var. *Debeauxii* mihi = *C. Debeauxii* Gren. et Godr. (Grenier in Mem. Soc. libre d'emul. du Doubs, iii., 20-22, 1849); Gren. & Godr. Fl. Fr., ii., 243; *C. pratensis* Thuill. Forme [or Race] *C. Debeauxii* Rouy Fl. Fr., ix., 127; *C. nigra* L., sub-sp. *C. Debeauxii* Gugler. Surrey plants identified as *C. Debeauxii* are here described. Stem about 40 cm., branched above, branches spreading, 12-15 cm. long, usually simple; leaves linear or linear-lanceolate, sub-entire, lowest sometimes lanceolate pinnatifid; capituli small, yellowish-green phyllaries not obscured by the linear-lanceolate disks of appendages which are more or less erect and not recurved. The Surrey plants thus briefly described have precisely the habit, leaves, and small heads of the specimens of *C. Debeauxii* issued by Schultz Herb. Norm. 88 and Billot exsicc. 807, and are in agreement with Grenier's description, who states that his species is allied to *C. nigra* by reason of its appendages with long teeth, and having the fruit pappose, but is distinguished from this by its much smaller heads, narrower appendages, shape of fruit whose point of attachment is different, and habit, which is very like that of *C. microptilon*. From this last it is known by the smaller heads, appendages not distinctly curved outwards, and longer teeth; fruits pappose, less tapering at the base. As regards the point of attachment of the fruit no reliable character can, I think, be drawn from this as the feature in question is not restricted to *Debeauxii*. Continental specimens differ from British plants in that they have "neater" looking heads owing to the disks of the appendages being darker than the teeth, more spaced, and slightly more uniform in shape, consequently it is proposed to term the native plants f. *anglica*. Disks of lowest appendages subulate, succeeding series as far as centre of head, linear-lanceolate, next series lanceolate, grading to roundish above. Otherwise like var. *Debeauxii*. Specimens of this were gathered by Dr G. C. Druce at Wilbury, Beds, and distributed through the Bot. Exch. Club (see *Reports* 1905 and 1919). It also occurs on chalk downs in Surrey.

The reason that has actuated the writer in reducing both *C. microptilon* Gren. and *C. Debeauxii* Gren. et Godr. to the rank of varieties of *C. nemoralis* Jord. is to be found in the circumstance that they only occur in the company of the latter species and that very sparingly. Under these conditions it is impossible to look upon them as distinct species.

Perhaps some surprise may be expressed at the recognition of two additional species of *Centaurea* and some further information may be thought desirable. It is quite certain that *C. surrejana* and *C. Drucei* cannot be placed under either *C. obscura* Jord. or *C. nemoralis* Jord., and it is equally certain that they have as good a claim to recognition as either of Jordan's species. The descriptions of this author and study of his authentic specimens abundantly justify these conclusions. It will be noted that the brief descriptions of the British forms make no mention of the hairs clothing the leaves. etc. In one case only has it been thought necessary to do so, in other cases the clothing of the leaves, etc., does not call for comment.

Excluded names.—*C. nigrescens* Bab. Man., ed. 2 (1847): *C. nigra*, var. *decipiens* Bab. Man. ed. 5 (1862), etc.; *C. nigra*. var. *decipiens* Syme Eng. Bot., are but radiant forms of varieties of *C. nemoralis* Jord. as specimens named by the authors in question plainly show. To *nemoralis* must also be referred *C. Jacea*, var. *nigrescens*, and var. *pratensis* of Williams' *Prodromus*. *C. decipiens* Thuill.: Briquet who has seen the type specimens in Thuillier's herbarium, says that this agrees perfectly with original specimens of *C. serotina* Bor. *C. nigra*, var. *rivularis* Williams' Prodr. Fl. Brit. i., 60. As far as I have had an opportunity of studying them, the plants referred by Williams to this are not *nigra* forms, but come in the *Jacea* group, being mostly representatives of *C. pratensis* Thuill. The true *C. rivularis* Brot. is closely related to *C. pratensis* and quite possibly British, as some Surrey plants are scarcely distinguishable from it. Under the name of *Centaurea microptiloides*, Mr C. C. Lacaita has distinguished plants noticeable for the narrow disks of appendages which do not overlap, and, in consequence, render visible the underlying phyllaries. The disks range from subulate, ovate-lanceolate, to roundish above. This form is plentiful in south England, and appears to me to be connected through numerous intermediate forms with other plants in which the phyllaries are concealed by the appendages. It is mentioned here, but not assigned a position in the series of forms included under *C. nemoralis* Jord. (to which, in my opinion, it undoubtedly belongs) as the author of the name has not yet published a description. Cultivated examples [Ref. No. 2425] were distributed by the writer through the Bot. Exch. Club (see *Report* 1921).

I am under great obligations to Dr G. C. Druce, Messrs C. E. Salmon, W. C. Barton, and W. R. Sherrin for the loan of Centaureas from their herbaria, and to other botanists for the privilege of seeing specimens.

NOTES ON VIVIPARY IN FESTUCA OVINA.

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Vivipary is not unusual even in some of the more common British Grasses. The writer has frequently met with it in *Cynosurus cristatus* and in *Alopecurus pratensis* and less frequently in *Phleum pratense*, *Festuca rubra*, *Lolium perenne* and in *L. perenne*, var. *multiflorum* grown under normal field or garden conditions.* It appears to occur in these grasses late in the season when the plant has already produced a crop of normal seed-bearing inflorescences. Here, therefore, vivipary seems to be merely a safeguard against either (1) the conditions having been unfavourable to the setting of seed in the early inflorescences, or (2) lack of opportunity for seeds then produced of establishing plants.

Since it has been found to occur in the above grasses it might be expected to appear also in most British grasses under certain conditions. The writer has, however, never found it to occur in *Festuca ovina* plants which normally produce seed-bearing inflorescences, even when such plants are grown under conditions which, in *Cynosurus cristatus*, occasion a relative abundance of viviparous inflorescences.

In the mountainous districts of Carnarvonshire (and elsewhere in Great Britain) a viviparous type of *F. ovina* is well-known to occur. It is usually found, often in great abundance, where the climate is very moist, and generally where the substratum on which it grows is also very wet. The writer has found this type growing quite well on *Sphagnum* bogs on the slopes between Pen-y-gwryd and Roman Bridge in Carnarvonshire. Occasionally it may also be found growing under much more dry conditions; for instance, a plant was found growing on a very dry stone-with-earth wall low down in Llanberis Pass, where it was associated with non-viviparous types of *F. ovina*.

In no case in this type of *F. ovina* have the viviparous inflorescences been found to have been preceded by seed-bearing inflores-

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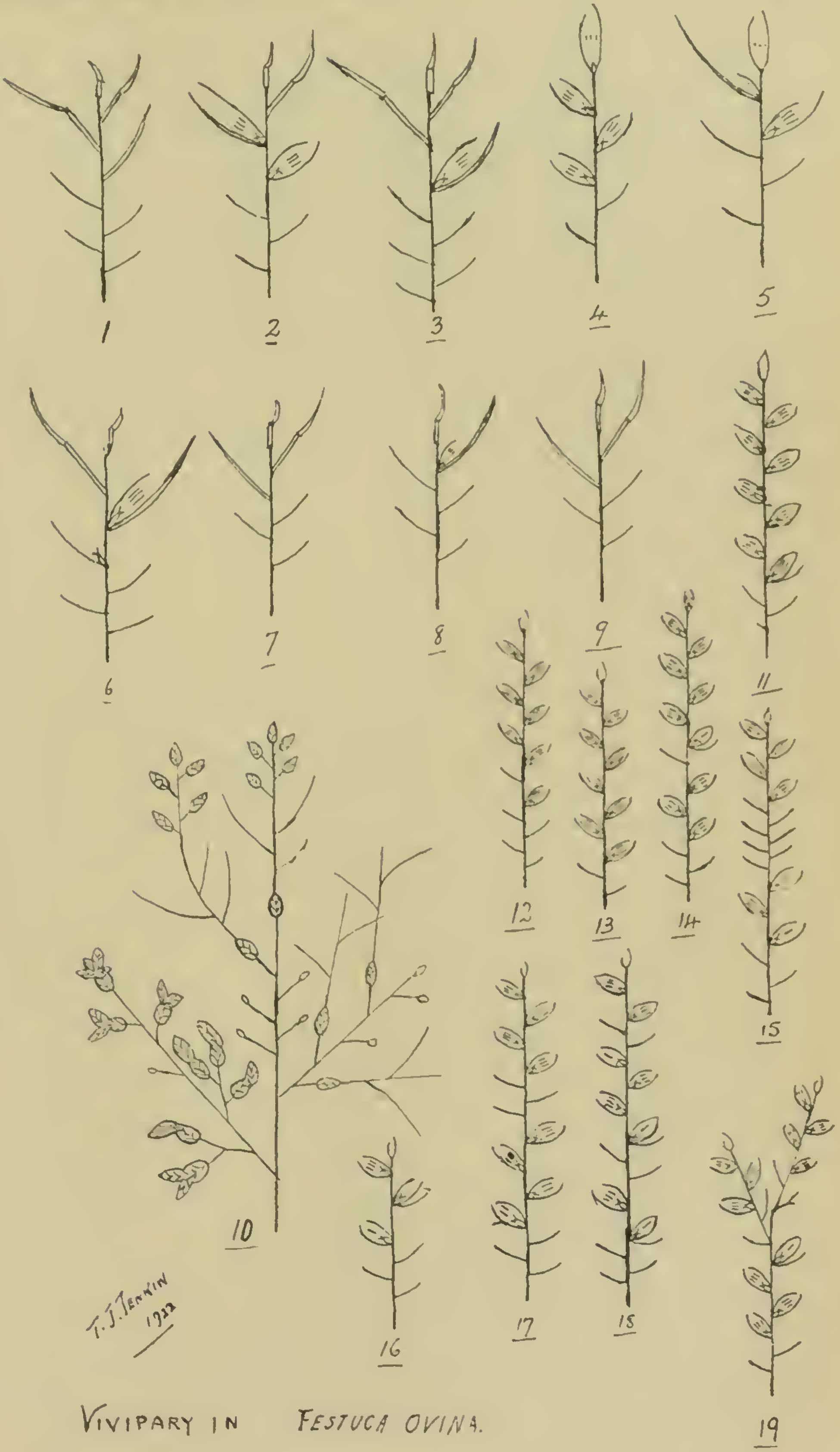
*The writer has also induced it accidentally in *Poa trivialis* and in *Deschampsia caespitosa* by growing them under abnormal (greenhouse) conditions.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T. J. Jenkin 1922

VIVIPARY IN FESTUCA OVINA.

cences in the same season. This suggests that the viviparous type of *F. ovina* is genetically different in this respect from the normal seed-bearing types, and this suggestion is considerably strengthened by facts to be mentioned later in this paper.

It seems very probable that in its natural habitat, this plant is normally propagated by means of " bulbils " produced in the viviparous inflorescences, even if this may not be the only method of propagation. The writer knows of no record showing that such is the case, nor even of records showing whether plants produced from these " bulbils " produce normally viviparous plants.

Hackel* classifies a viviparous type of *F. ovina* as *F. ovina* sub-sp. *eu-ovina*, var. *supina*, sub-var. *vivipara*, and he mentions that this has been found constant under garden conditions.

The North Wales specimens examined by the present writer do not seem to conform exactly to Hackel's description, but it is not intended at present to discuss the systematic position of these fescues. The viviparous type, however, may ultimately be found to deserve a higher position than subvarietal.

The North Wales type was also found to be similarly constant (or practically so) under garden cultivation at low elevations.

In 1916, a test of a somewhat different character was started. Viviparous inflorescences were collected near Rhyd-ddu, Carnarvonshire, and the " bulbils " planted at first in pots, and when established, transferred to open ground in the Advisory Grounds, University College of North Wales, Bangor, at an elevation of less than 50 feet above sea level. Two such plants were obtained, and in their positions in the Advisory Grounds they were associated with other indigenous types of *F. ovina* and of *F. rubra*, all spaced out.

In 1917, these two plants gave rise to a few inflorescences which appeared to be in no way different from those produced in the natural habitat of the viviparous type of *F. ovina*.

In 1918 a far greater number of inflorescences were developed, and all appeared to be normally viviparous. Very late in the season, however, one or two inflorescences were produced in each plant which approached much more nearly to the normal seed-

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*Hackel, E.: *Monographia Festucarum Europaearum*. Theodor Fischer, Kassel and Berlin, 1882, p. 89.

bearing type found in typical *F. ovina.* Even these showed distinct vivipary, but a few apparently normal florets were found, and later, when the plants were harvested and carefully searched, six " seeds," with apparently well developed caryopses, were found.

It was, unfortunately, impossible to plant these in 1919, but in 1920 (when the seed was nearing two years old) they were planted in the gardens of the Plant Breeding Station at Aberystwyth, and four plants were obtained.

In the same year, part of one of the two parent plants was transferred to Aberystwyth, and in 1921 it behaved as in 1918, producing at first an abundance of normally viviparous inflorescences in spite of the naturally dry character of the ground and the abnormally dry summer, and then much later, one or two inflorescences approaching the normal seed-bearing type.

The writer has not been able to ascertain whether such late seed-bearing inflorescences may be produced by the normally viviparous plant when growing in its natural habitat, nor whether such a plant would produce them if transferred bodily to a drier habitat. Since it seems reasonable to assume that these plants are the natural progeny of " bulbils " in most, if not in all, cases, there seems to be no reason to suppose that they would behave differently from those obtained by the writer from such " bulbils." In any case, it was clearly shown in 1921 that plants produced from " bulbils " in 1916 had not perceptibly progressed towards the seed-bearing condition.

The fact that the great majority of the inflorescences produced by this type of *F. ovina* are fully viviparous, and that only very late in the season are more or less seed-bearing inflorescences developed, shows that, as already suggested, the order of things has been completely reversed as compared with most grasses.*

In 1921, another phenomenon was noticed in the parent plant (hereafter referred to as Bl. 303) transferred from Bangor. At about the same time that the late seed-bearing inflorescences appeared some of the "bulbils" in the fully viviparous inflorescences produced short secondary flowering stems with small secondary inflorescences consisting of about five spikelets. These spikelets very closely approached the normal and showed but slight signs of vivipary. Such secondary inflorescences are diagrammatically shown in Fig. 10. (The inflorescence there represented, however, belonged to another plant.)

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*It is, of course, open to argument which of the two methods is the more primitive.

The four plants obtained from seed were grown under garden conditions in 1921, along with plants obtained from seed of non-viviparous types of *F. ovina* and *F. rubra*, but as in none of the latter (except very late in the season in one *F. rubra* plant) were viviparous inflorescences produced, any vivipary shown in these four plants must be ascribed to the inherent qualities of the plants themselves.

As already mentioned, however, the seeds themselves were produced under open conditions. That is to say, the parent plants were not protected, and since cross-pollination is probably the normal method in these grasses, it is possible that some or all four seeds were themselves hybrid in character. It is most unlikely that the two parent plants mutually pollinated each other as they were planted at a considerable distance apart, with other plants, both *F. ovina* and *F. rubra*, in between.

The four plants alluded to above will henceforward be referred to as Bl. 178 (1), Bl. 178 (2), Bl. 178 (3), and Bl. 181 (1). The first three were obtained from seed produced by the same parent plant.

The inflorescences produced in 1921 by Bl. 178 (1) and Bl. 178 (3) were apparently throughout quite normal seed-bearing in character, except that an occasional inferior palea was unequally bifurcated or trifurcated. The writer has not found this bifurcation of the inferior palea in normal seed-bearing *F. ovina*, but it may occur. For reasons connected with the further study of the plants, it was not possible in 1921 to ascertain whether the two plants in question were capable of producing a fair amount of seed or not, and for the present a discussion of these two plants will be deferred.

The great majority of the inflorescences of Bl. 178 (2) and at least a few of those of Bl. 181 (1) were quite obviously viviparous when they emerged from the sheath. Those of Bl. 178 (2) resembled the fully viviparous inflorescences of the parent plant, Bl. 303, in general appearance, but the " leaves " in the inflorescences were markedly shorter. Some of the inflorescences of Bl. 181 (1) bore " leaves " equal in length to those of the parent plant, but in other respects even these differed widely from those of Bl. 303, while other inflorescences differed from all other types of *F. ovina* hitherto met with by the writer. In fact, most of the inflorescences of Bl. 178 (2) and Bl. 181 (1) were obviously different both from those produced by normal seed-bearing types of *F. ovina* and from fully viviparous types, not excepting the late inflorescences produced by the latter type.

A large number of the spikelets of the parent plant, Bl. 303, of Bl. 178 (2), and of Bl. 181 (1) were carefully dissected, and some of the more interesting departures from normal are described below. For descriptive purposes, the " normal floret " is considered to consist of an inferior palea and a superior palea enclosing three stamens and a normal ovary. The lodicules were but rarely observed.

In order to facilitate description, diagrammatic sketches have been prepared. These have not been drawn exactly to scale, since they are only intended to indicate the order in which the various structures occurred.

Bl. 303.—Parent plant.

The late inflorescences could not be investigated in detail, but these were so few that for practical purposes the plant may be considered to be fully viviparous, as in fact were the very great majority of the inflorescences. These inflorescences with their viviparous spikelets were so uniform that it seems quite sufficient to describe a single spikelet. Fig. 1.

Starting from below :—

(a) Pair of normal glumes.

(b) One or two structures, usually rather more closely resembling the first pair of glumes than inferior paleae, and, as in the case of the first pair of glumes, bearing no trace of superior paleae nor of male or female organs. In some cases both members of this second pair were absent; in other cases only one was present. When all four are present, the lowermost is usually the shortest, and the uppermost may be appreciably longer than an ordinary inferior palea of *F. ovina*. In some cases the upper two more closely resemble sterile inferior paleae than glumes.

(c) A sheath-like structure considerably longer than those under (a) and (b) above, but with no lamina. Probably of the nature of a praefolium.

(d) A leaf, well marked into sheath and lamina, forming the outer part of a vegetative bud; no trace of male or female organs.

In no case apparently does a bud arise in the axils of the structures placed under (a) and (b) above, but one has been found in the axil of (c). In the course of the season the main vegetative bud, as already shown, may even produce a secondary inflorescence. In one such case examined June 11th, 1921, there were three leaves above (c), definitely spaced out on a secondary flowering stem, with vegetative buds in the axils of (c) and the lowest stem leaf. In this particular case there was a bract-like structure at the base of the secondary inflorescence* and the inflorescence consisted of five apparently normal spikelets.

Bl. 178 (2).

On the 24th May 1921, 52 inflorescences had emerged or were emerging from their sheaths, and each one showed vivipary in most spikelets, and all spikelets appeared to resemble each other rather closely. As will be seen from the descriptions and figures there was a considerable difference in detail. Three inflorescences were critically examined on 31st May, but representative spikelets only can here be described and figured.

Inflorescence A.

(1) Lowest spikelet of inflorescence. Fig. 2.
    (a) Pair of normal glumes.
    (b) A structure exactly similar in size and shape to the inferior palea of a normal floret, but lacking a corresponding superior palea and lacking male and female organs†.
    (c) Normal floret.

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*Such a bract frequently occurs also at the base of the late sub-normal inflorescences produced by this fescue.

†As such structures were frequent in the spikelets of Bl. 178 (2) and Bl. 181 (1), in further descriptions they will only be referred to as "Sterile inferior palea."

- (d) A pair of elongated paleae (inferior palea 7.5 mm. long as compared with the normal 4 mm.), enclosing apparently normal male and female organs.
- (e) Terminal floret consisting of a leaf well marked into sheath (5 mm. long) and lamina (7 mm. long) enclosing a second younger leaf but no trace of male or female organs.

(2) Lowest spikelet at second branching of inflorescence. Fig. 3.
- (a) Pair of normal glumes.
- (b), (c), and (d) Sterile inferior paleae.
- (e) Elongated pair of paleae (inferior palea 10 mm., superior palea 5 mm. long), enclosing apparently normal ♂ and ♀ organs and lodicules.
- (f) A vegetative bud of three leaves, the outer leaf 14 mm. long and well marked into sheath and lamina.

(3) Terminal spikelet. Fig. 4.

This spikelet was much nearer normal than any of the others.
- (a) Normal glumes.
- (b), (c), and (d) Normal florets.
- (e) Terminal floret: inferior palea slightly longer than normal and both ♂ and ♀ organs rudimentary.

Inflorescence B.

(1) Lowest spikelet. Fig. 5.
- (a) Normal glumes.
- (b) Sterile inferior palea.
- (c) Normal floret except inferior palea elongated to 5.8 mm.
- (d) Inferior palea sheath-like, 13 mm. long; superior palea abnormally short; ♂ and ♀ organs very poorly developed.
- (e) A rudimentary floret with extremely minute stamens but no ovary recognisable.

(2) Spikelet at fourth branching of inflorescence. Fig. 6.
- (a) Normal glumes.
- (b) Sterile inferior palea.

- (c) Inferior palea of normal length; no superior palea; well developed lodicules; a fairly well developed ovary, but no trace of stamens.
- (d) Inferior palea 10 mm. long, purplish and sheath-like with margins overlapping; superior palea 4.5 mm. long; ♂ and ♀ organs normal.
- (e) Rudimentary ♂ and ♀ organs together with a leaf-like structure 3.5 mm. long enclosed within the sheath of a leaf. Sheath of this leaf 4 mm., lamina 5 mm. long.

(3) Terminal spikelet. Fig. 7. Cf. Figs. 1 and 9.
- (a) Normal glumes.
- (b) Sterile inferior palea.
- (c) Sheath-like structure, margins overlapping, 7.2 mm. long; no superior palea nor ♂ or ♀ organs.
- (d) Vegetative bud; outer leaf 7 mm. long; no ♂ or ♀ organs.

Inflorescence C.

(1) Spikelet from middle of inflorescence. Fig. 8.
- (a) Normal glumes.
- (b) Sterile inferior palea.
- (c) Slightly elongated sterile inferior palea.
- (d) Sheath-like inferior palea, and a relatively short superior palea enclosing poorly developed ♂ and ♀ organs.
- (e) A leaf structure with no trace of ♂ or ♀ organs.

(2) Terminal spikelet. Fig. 9.
- (a) Normal glumes.
- (b) Slightly elongated sterile inferior palea.
- (c) Much elongated, sheath-like structure (8.5 mm. long)
- (d) Vegetative bud, the outer leaf well ribbed in upper part.

The terminal spikelets in inflorescences B and C (Figs. 7 and 9) are seen to be fully viviparous and exactly similar to such spikelets found in the parent plant Bl. 303 (Fig. 1). On the other hand, the terminal spikelet in inflorescence A was almost normal. In this plant therefore it is very probable that spikelets could be found forming a complete series bridging the normal and the fully viviparous.

The spikelets in this plant also suggest a method by which one type of inflorescence may have evolved from the other.

Bl. 181 (1).

When examined on 24th May 1921, 48 inflorescences (three of which were dead) had emerged or were emerging from their sheaths. Five of these, including one of the dead ones, showed very marked but quite abnormal vivipary. One of these, which is shown diagrammatically in Fig. 10, may here be briefly described :—

Inflorescence A. Fig. 10.

Lowest branching—Only one branch at base, but this compound.
  Lowest spikelet—Normal at base, but giving rise within its tip to two secondary spikelets. Such a spikelet is fully described under Bl. 181 (1), Infl. D (3), and is shown diagrammatically in Fig. 19.
  2nd spikelet—Long and distinctly curved : such a spikelet is described under Bl. 181 (1), Infl. C (3), and is shown diagrammatically (without curvature) in Fig. 15.
  3rd, 4th, and 5th spikelets as 2nd.
  6th spikelet abortive.
  7th and 8th spikelets as lowest.
  9th spikelet as lowest but giving rise within its tip to four secondary spikelets.
Second branching—Simple, six spikelets.
  Lowest spikelet simply (but fully) viviparous, producing a leafy shoot but no secondary inflorescence.
  2nd and 4th spikelets as lowest.
  3rd, 5th, and 6th spikelets abortive.

Then followed spikelets borne singly on the main axis; the lowest four abortive, the 5th at first simply viviparous but giving rise to a secondary inflorescence of five apparently normal spikelets.

Terminal spikelet similar to the fifth.

The other four inflorescences differed considerably in detail from the one described, but all five were obviously of the same general type.

The remaining inflorescences of this plant appeared to approach much more closely to the normal *F. ovina* inflorescence, but these again varied, some of them having practically the appearance of normal inflorescences, while others were distinctly abnormal, although not obviously viviparous. Four of these were examined in detail; B and C most nearly approaching the normal.

Inflorescence B.

At lowest branching six spikelets occurred, three of which were normal. Another was also normal except that one inferior palea was unequally bifurcated. The remaining two spikelets each had a sterile inferior palea following immediately after the glumes, but were otherwise normal.

Two of the four spikelets at the second branching were also normal, and another was normal except that a sterile inferior palea occurred between the glumes and the normal florets.

The remaining spikelet (Fig. 11) was quite abnormal:—

(a) Two glumes, the lower very small.
(b) Sterile inferior palea.
(c) A normal inferior palea with apparently a second such palea within it with its margins completely united with the margins of the superior palea to form a sac, within which were normal ♂ and ♀ organs.
(d) etc. Seven normal florets and a terminal abortive one.

None of the remaining eight spikelets of the inflorescence was normal. As a rule, however, the abnormality consisted of one or two sterile inferior paleae being interposed between the glumes and the normal florets. In one case (Fig. 12) this was varied as follows:—

(a) Normal glumes.
(b) and (c) Sterile inferior paleae.
(d) Normal floret.
(e) Sterile inferior palea.
(f) etc. Six normal florets and a terminal abortive one.

In another spikelet one inferior palea was unequally trifurcated.

Inflorescence C.

In this inflorescence there were 17 spikelets, nine of which were apparently quite normal. The other spikelets differed but little from the abnormal spikelets described under inflorescence B.

Inflorescence D.

This was obviously farther from normal than B and C, and possessed a much higher proportion of long, curved spikelets. Only a few spikelets, to serve as types, will be described for this and for inflorescence E.

(1) Lowest spikelet in inflorescence. Fig. 13.
  (a) Normal glumes.
  (b), (c), and (d) Normal florets.
  (e) Normal inferior palea, rudimentary superior palea; normal ♀ organ; one deformed stamen.
  (f) etc. Four normal florets and a terminal abortive floret.

(2) Fourth spikelet in lowest branch. Fig. 14.
  (a) Normal glumes.
  (b) Sterile inferior palea.
  (c), (d), and (e) Normal florets.
  (f) Sterile inferior palea.
  (g) Normal inferior palea; superior palea forming a complete sac enclosing a normal ovary and one stamen.
  (h) etc. Six normal florets.

(3) Lowest spikelet at second branching. Fig. 15.
  A typical "curved" spikelet.
  (a) Normal glumes.
  (b) Sterile inferior palea.
  (c) Normal floret but with only one stamen.
  (d) and (e) Normal florets.
  (f) etc. Seven sterile inferior paleae followed by four normal florets and a terminal abortive floret.

(4) Lowest spikelet at third branching. Fig. 16.
  (a) Normal glumes.
  (b) Sterile inferior palea.
  (c) Normal paleae and ovary but only one stamen.
  (d) Inferior palea normal, but within it an additional inferior palea with superior palea and ovary but no stamens.
  (e) Normal floret.
  (f) Terminal abortive floret.

Several of the remaining spikelets in this inflorescence abortive. but most of the spikelets agreed more or less closely with one or another of those described.

Inflorescence E.

Most of the spikelets in this inflorescence differed but little from one or another of those described under inflorescence D. The following additional types are, however, interesting :—

(1) Fig. 17.
  (a) Normal glumes.
  (b) Sterile inferior palea.
  (c) Normal floret, except only two stamens present and inferior palea unequally bifurcated.
  (d) Normal floret, except only two stamens present.
  (e) As (d).
  (f) Normal floret.
  (g), (h), and (i) Sterile inferior paleae.
  (j) etc. Four normal florets and a terminal abortive one.

(2) Fig. 18.
  (a) Normal glumes.
  (b) Sterile inferior palea.
  (c) Normal inferior palea ; superior palea forming a complete sac enclosing a normal ovary and one stamen.
  (d) Normal floret.
  (e) and (f) Sterile inferior paleae.
  (g) Exactly as (c) above.
  (h) and (i) Normal florets.
  (j) Normal floret except only one stamen present.
  (k) and (l) Sterile inferior paleae.
  (m) and (n) Normal florets.
  (o) Terminal abortive floret.

(3) Fig. 19.
  (a) Normal glumes.
  (b), (c), and (d) Normal florets.
  (e) As (c) in (2) above.
  (f) Sterile inferior palea.
  (g) Sterile inferior palea deeply but unequally bifurcated.

At this point the rachilla of the spikelet became bifurcated, giving rise to two secondary spikelets deeply set in on (f) and (g) respectively. That on (f) consisted of two sterile inferior paleae, three normal florets, and a terminal abortive floret, while that on

(g) consisted of one sterile inferior palea followed by four normal florets and a terminal abortive floret.

(4) The sub-terminal spikelet (not figured).

- (a) Normal glumes.
- (b) and (c) Sterile inferior paleae.
- (d) Normal floret.
- (e) As (c) in (2) above, except superior palea short and deformed.
- (f) Sterile inferior palea.
- (g) Normal floret.
- (h) Normal floret except only one stamen present.
- (i) Normal floret.
- (j) Sterile inferior palea.
- (k) etc. Three normal florets and an abortive terminal floret.

It is quite obvious from the above descriptions that not only do Bl. 178 (2) and Bl. 181 (1) differ quite markedly from the normal and from the fully viviparous, but that they also differed from Bl. 178 (1) and Bl. 178 (3). They also further differed quite markedly from each other in 1921.

Bl. 178 (1) and Bl. 178 (3) were so nearly normal in 1921 that the question arises whether by some accident seeds of normal plants had not been accidentally substituted for the original ones. This is, of course, possible, but not very probable as great care was taken with these seeds. The other possibilities seem to be either :—

(1) That the parent viviparous plant was hybrid in character, and that Bl. 178 (1) and Bl. 178 (3) were normal segregates ; or

(2) That in 1918 cross-fertilisation took place and that the normal character of the inflorescence is dominant over vivipary.

As it is intended to study these plants further, the question need not at present be further discussed.

The fact that Bl. 178 (2) and Bl. 181 (1) differed so markedly from each other while yet showing very obvious signs of vivipary is interesting. In both plants fully normal and fully viviparous spikelets were found, but the intermediate stages were quite different in the two plants. This suggests the following possibilities, either :

(1) That the two parent plants were genetically different ; or

(2) That the individual seeds which produced the two plants were different even though the two parent plants were genetically identical. Such a state of affairs would occur if one of the seeds had been produced by self-fertilisation and the other through cross-fertilisation. It is rather curious, however, that the fully viviparous condition was not reproduced in either plant except in individual spikelets.

The various types of florets occurring in Bl. 178 (2) and Bl. 181 (1) tempt one to search amongst them for an elucidation of the phylogeny of the various parts of the grass spikelet. This, however, will not at present be attempted, as Bl. 178 (2) and Bl. 181 (1) show obvious differences from each other, and it is not known whether either of them really affords a reliable clue to this problem.

From the facts given above the following conclusions appear to be justified :—

(1) The vegetative buds produced in normally viviparous inflorescences of *Festuca ovina*, even when cultivated under garden conditions at low elevations, produce normally fully viviparous inflorescences.

(2) Such plants may, at least in some seasons, develop late inflorescences which may produce seed when the plants are grown unprotected alongside normal types of *F. ovina* and *F. rubra*.

(3) The foregoing characteristics have been found constant over four seasons and the proportion of late sub-normal inflorescences does not seem to increase from year to year.

(4) Seeds produced by such late sub-normal inflorescences may in their turn give rise to plants which show very distinct vivipary, the vivipary in some spikelets being normal and complete.

(5) It follows, therefore, that vivipary in *F. ovina* is to some extent at least hereditary, and that it is inherited not only through the vegetative buds developed in the fully viviparous inflorescences, *but also through such " seeds " as the plant may be able to produce.*

(6) Seeds produced by such sub-normal inflorescences under unprotected conditions may give rise to plants the inflorescences of which may differ very markedly from each other even though each in its own way may be showing very distinct traces of vivipary.

NOTES ON THE SEEDS OF THE BRITISH DACTYLORCHIDS.

By T. A. Dymes, F.L.S.

In this paper I have purposely used the non-committal name " Spotted Orchis " for that form, and that form only, of the polymorphic species, commonly known of yore as *O. maculata* L., which Dr Druce has described separately as *O. Fuchsii*; it does not include the form or forms described by their author as *O. elodes*, *præcox*, or *ericetorum*. I do this, not as a bigoted die-hard, but because in my complete ignorance of the critical niceties of botanical nomenclature I hold no opinion upon such controversial questions, my object being to avoid confusion. Similarly *Orchis ericetorum* Lint. stands for what Dr Druce believes to be *Orchis maculata* L., what Webster described as *O. præcox*, and what may, or according to some, may not be *O. elodes* Griseb.

Whatever the merits of the case may be, however, few, if any, of those who are interested in our native Marsh Orchids will dissent from the view that the Spotted Orchis, in the sense just indicated, and *O. incarnata* L. deserve separate recognition, whether they be called species or by some other equally vague if less controversial name.

Their morphological differences, appreciable with the naked eye, or a lens, are sufficiently conspicuous, to say nothing about others, but perhaps on account of their smallness the seeds appear to have received little or no attention. With a strong belief in the conservative virtues of seeds in general, and with some slight practical acquaintance with them in other connections, the present writer decided to put them into the witness box, so to speak, in order to test the value of their evidence for elucidating the problems presented by the British forms of that section of the genus Orchis which is aptly known as Dactylorchis. For this purpose none but thoroughly ripe seeds are of any use, for those that are immature are very misleading.

When mounted as transparent objects and examined with a microscope they are seen in surface view to consist of a gauzy cage, the testa, open at one end, the basal, where it broke away from the placenta, and enclosing a darker body, the kernel, which is the embryo and endosperm closely invested by the inner integument.

Roughly speaking the kernel is oval or oblong in outline, but the symmetry is compromised at the basal end by a protrusion through the integument, like the rim of a funnel, which belongs morphologically to the suspensor, and through which the mycorrhiza gains admittance to the interior.

The funnel-rim is easily recognised by its position, its distinct form, and its colour, which in my own preparations is usually ruddy. At the opposite or apical end of the kernel the cells often differ in colour from those of the rest of the integument, and it may be that this marks the spot through which the infant seedling will break on germination.

I must emphasise the necessity of using only ripe seeds and, so far as the kernel is concerned, these are they that respond to the following tests :—

1. That the funnel-rim be cleanly cut and clearly defined, without any remains of the suspensor between itself and the base of the testa.

In immature seeds such remains appear as a frayed or ragged streak tailing off untidily, often for a considerable distance.

2. That the margin of the kernel and also its component cells be likewise cleanly cut and clearly defined.

In immature seeds the common walls and the surface of the cells themselves are indistinct and blurred, and moreover the kernel is larger, because water has still to be expelled before the resting stage is reached. The colour differentiation of the apical cells is not always in evidence, but whenever it is, I pass that seed as worthy of examination unless the other two points are unsatisfactory.

Although I do not know the meaning of such differentiation, I am not sure that seeds that are without it are fully mature.

It is not always easy to be certain about the testa. The question must be decided in case of doubt not only by the condition of the kernel which, I believe, ripens first, but by exercising judgment and by examining the individual about which one is dubious for characteristic features presented by its more finished fellows from the same plant.

But to return to the Spotted Orchis and *O. incarnata*. They differ from one another in several ways, for example in colour, shape and size, as well as in the details of both testa and kernel.

The difference in colour, however, is but slight, for when both are seen in bulk with the naked eye all that can be said is that the testa of *incarnata* is a shade darker than the other's.

As to size, *incarnata* has the smaller seeds, which are shorter but broader than those of the Spotted Orchis. The seeds of the latter are broadest in the middle, and the apical half of the testa, above the kernel, is curved and tapers almost to a point; in *incarnata* the apical half is neither curved nor tapering, the broadest part of the testa being on the contrary near the apex. In both cases the seeds narrow to some extent from kernel to base.

The testa of the Spotted Orchis consists of cells that are mostly long and narrow, and the common walls are narrow too, whereas those of *incarnata's* are comparatively broader and shorter, with broader common walls, which, rising above the general level, give the appearance of marginal papillae here and there.

But there is another interesting difference, for the testal cells of the Spotted Orchis show coils of thickening which are entirely absent from those of *incarnata*.

Turning now to the kernel, differences are to be noted both in shape and size. The Spotted's is longer than *incarnata's*, and also narrower; in other words, *incarnata's* is the rounder; it is oval rather than oblong.

However slight they may appear in description, all these differences are so marked and so constant that having once appreciated them, one could never mistake the seed of the one for that of the other, nor a testa without a kernel, or even a kernel without a testa, provided always that one is dealing with ripe seeds.

It may be of interest to add that the testa of the Spotted Orchis is about four times, and of *incarnata* about three times, as long as the greatest breadth, the length of the kernel of the Spotted being 1⅔, and of *incarnata* 1⅓ times the breadth. These figures were deduced from eighteen seeds of each form from several different places in the British Isles, and the range of variation was so limited that if the shortest seed of either had been a little more than a yard, the longest would still have been appreciably less than a metre, and the same may be said even more emphatically for the kernel.

A third Marsh Orchis, easily recognised, at anyrate in its most pronounced form, is *O. praetermissa* of Dr Druce, and its ripe seeds can be known from both of the other two's without much difficulty.

The difference in colour is hardly, if at all, appreciable. As to shape, the testa of *praetermissa's* is broadest around the kernel, or just above it, whereas the broadest region of *incarnata's* is much nearer the apex.

Praetermissa's seeds are the largest of the three, being longer than those of the Spotted Orchis' and broader both actually and proportionately, but in all other respects they approach closely to *incarnata's*.

The testal cells are of the same type, with broad, raised, common walls, but without any coils; in *praetermissa* they are larger than in *incarnata*, so that the former has the looser and the latter a decidedly closer mesh. Again, *praetermissa's* is distinctly the narrower seed, for it is just over four instead of three times as long as its greatest breadth.

Praetermissa's kernel is somewhat larger than *incarnata's*, and the difference is noticeable because it is almost as broad as the testa itself in that region, whereas in *incarnata* it is narrower than the testa around it. The result is that in *incarnata* there is a distinct margin of clear testal cells on either side of the kernel, whereas in *praetermissa* this margin is very much reduced. I measured it in six seeds of each form, and found that *incarnata's* averaged more than two and a half times the breadth of *praetermissa's*.

Thus these two differ in shape and size as well as in the other characteristics that I have indicated, perhaps on the whole more than one would have expected of seeds that are in essentials so alike, the range of variation being again extremely small, and the material being drawn from various British localities.

Of the other forms with which I deal in this paper, I have not had the same advantage of ample supplies from different parts, but so far as they go, my results are, to the best of my knowledge and belief, correct for the material at my disposal.

Turning to *O. ericetorum* Lint., its seeds are in most respects similar to those of the Spotted Orchis, but the apical half is neither so curved nor so tapering, and the long narrow cells are not so much in evidence. On the other hand, the coils are there, but they are not always so well developed as in the Spotted Orchis, or it may be that the testa was not always completely ripe.

The kernel appears to be always about 30 per cent. longer than that of the Spotted Orchis, while the proportion of its length to its breadth is almost 1¾ : 1. The testa is longer and narrower, being nearer five than four times as long as its greatest breadth.

These observations were made upon seeds from three different localities in the British Isles. Except for the measurements of the ripe kernel, the range of variation seems to be somewhat greater than in any one of the other three forms already dealt with, but it is still slight, being not more than 10 per cent. for the measurements of the testa.

I have, either rightly or wrongly, gradually come to associate coils of thickening in the testal cells with the "*maculata*" group, and, from an examination of the seeds of some other native Orchids, also, but not exclusively, with a dry habitat, and it may be that their being less pronounced in *O. ericetorum* is due to that plant growing in wet places, but this, or any other explanation, would require a great deal more investigation to justify the formation of an opinion.

While the completely ripe seeds of these two forms the Spotted Orchis and *O. ericetorum* seem to be distinguishable, they would be hard to separate if either kernel or testa were immature, but although this paper does not deal with the fruits I may perhaps add that I have found that cross-sections of the immature capsules show free wings to the ribs in *ericetorum*, whereas in the Spotted Orchis rib and valves are almost completely concrescent in fruits considerably nearer to dehiscing, but still not nearly ripe.

The only seeds that I have had of *Orchis O'Kellyi* Druce came from Ballyvaughan. Like those of *ericetorum*, they exhibit all the peculiarities which distinguish the Spotted Orchis from *O. incarnata* and *O. praetermissa*, as well as some minor ones of their own. They have beautiful coils, but they are about six times as long as broad, the length of the kernel is almost twice its breadth, and there is still less curving and tapering of the apical portion of the testa. Length and narrowness are their most striking features, and the latter is somewhat enhanced by the testa fitting closely around the kernel. The capsule is shorter than that of any other Marsh Orchis that has come under my notice without being narrower than in *ericetorum* or in the Spotted Orchis, and it agrees with the latter in the concrescence of rib and valves.

I have been fortunate in obtaining seeds of *Orchis purpurella* Steph. p. & f. from two localities. They are darker than either *praetermissa's* or *incarnata's*, both of which are, by the way, darker than any of the "*maculata*" forms that I have seen, and after being soaked in alcohol the testal cells of *purpurella* remain plainly darker than those of any of the others. They are shorter and a trifle broader than either *praetermissa's* or *incarnata's*, whereas the kernel is smaller than *praetermissa's*, but larger than *incarnata's*. The testa is almost three times as long as its greatest breadth, whereas the proportions for the kernel are not quite 1½ : 1. The testa resembles *praetermissa's* in being broadest just above the kernel, but differs from *incarnata's* in its narrow apex. The two regions, broad and narrow, are pretty abruptly defined by an indentation just above the kernel on one or both sides, the portion above the indentation being slightly curved. I could find no coils of thickening in the testal cells which have the form and the common walls of *incarnata* and *praetermissa*, the mesh being suggestive of the latter rather than of the former.

Before dealing with that prize puzzle, *Orchis latifolia* L., whatever that fearsome specific name may mean in this kingdom, I may remark that I am greatly impressed by the very small range of variation that my measurements reveal; a difference amounting to 10 per cent. in the length of the testa can be of little or no account because it means at most that the seed broke away less than a tenth of a millimetre nearer to or farther from the placenta, as the case may have been, and this could have been done quite easily within the limits of a single cell.

For the kernel, in which there is no breaking away, I have measured seed after seed of the same form without being able to detect a difference of more than 3 or 4 per cent.

I find some satisfaction in realising that one result of this investigation has been to stamp upon my mind a pretty clear picture of the differences which distinguish the seeds of those forms that I have described. They fall into two series, "*maculata*" and "*latifolia*," and the appeal to the mental eye is enough without having to resort to micrometer measurements, which I have nevertheless made carefully for obvious reasons.

Coils of thickening and narrow common walls characterise the long narrow seeds of the "*maculata*" group, as against the absence of coils, the broader raised common walls and the proportionately broader seeds of the "*latifolia*." But while the presence or absence of coils and the narrower or broader common walls distinguish the two readily enough, the forms within each group can be separated by nothing so positive or so definite, but merely by the comparative degree of their other qualities.

In the "*maculata*" group we have Dr Druce's *Fuchsii* with its curved and tapering apex, *Orchis ericetorum* Lint. with its longer kernel and less pronounced curve, and *Orchis O'Kellyi* Druce with its long almost straight testa closely investing the narrow kernel, the apical curvature of the testa being still less in evidence.

Under "*latifolia*," I see the seeds of *incarnata* L. close meshed, short and broad, with the apical dilation of the testa and the clear margin of testal cells on either side of the kernel; those of *praetermissa* Druce longer and narrower with a looser mesh not dilated at the apex, and with the kernel almost obliterating the testal margins; and then those of *purpurella* Steph. p. & f., which might almost be a small edition of either of the other two but for the dusky tinge of the testal cells and the abruptly pointed apex, indented at the base.

But I hesitate to confess how long it was before I could see these things in what I believe to be their true perspective; not until I had learnt how to treat the material and how to know the immaturities and abortions, due sometimes to minute parasites, from the fully ripe seeds. Until then all appeared to me to be but confusion and chaos.

In a comparative investigation of this sort, however, the material must be mature to the very last degree, for to work with seeds at different stages of development would be merely to court disaster, and I know no way of being sure that they are at the same stage except to discard without mercy all those about the full maturity of which there is any reasonable doubt. But even so, confusion and chaos characterise that controversial conundrum in this country commonly known as *Orchis latifolia* L. I have had seeds kindly sent to me from several different places, but I can make nothing orderly out of any of them.

They conform as a whole neither to the "*maculata*" nor to the "*latifolia*" type nor yet to one of their own, the range of variation is great, and I believe that the proportion of immature and abortive seeds is greater than usual in the other forms, which may, however, be due to parasites, and does not necessarily argue physiological sterility.

In a harvesting from France most of the ripe seeds had coils, whereas in another from Chippenham most of them had none. In a third lot collected from a ring-leaved plant near Reigate it was with difficulty that I could find any seeds that satisfied me about their ripeness, but those that I selected possessed coils, whereas in another plant without rings, but with small spots, the very few seeds that I passed had no coils at all, but a few lines of thickening here and there.

The variations in size, shape and proportions, so far from being small as in the other forms, were so great even among seeds from the same plant, and so obvious as to make the taking of measurements not worth while, except perhaps for a separate investigation of each particular puzzle, which I did not attempt.

Hence, while I feel about the other six forms dealt with in this paper that a more extensive and detailed study of the seeds might possibly yield something useful to the systematic botanist, *Orchis latifolia* L. remains for the author a suggestive mystery to be solved by the experimental geneticist rather than by the morphological or the field botanist. I greatly hope that someone with the necessary knowledge and skill, patience and facilities, will take these plants in hand, and with the help of Mendelism, will tell us what they really are, building upon the sure and certain foundations of scientifically ascertained facts, derived from the plants themselves.

NOTES ON THE BRITISH BATRACHIA.

WILLIAM HARRISON PEARSALL.

R. TRICHOPHYLLUS Chaix in Villars *Hist. Pl. Dauph.* i., 335, 1786, emend. *R. divaricatus* Schrank, *Baier. Fl.* ii., 104, 1789, non Koch. *R. aquatilis*, e. *pantothrix*, Koch in Sturm. *Deutschl. Fl.* hf. 67, f. 1835. *Batrachium bipontinum* F. Schultz, in Gren. et Godr. *Fl. Fr.* i., 24, 1848. *B. trichophyllum* Van den Bosch, *Prodr. Fl. Batav.* 5, 1850. Both *R. trichophyllus* Chaix and *R. divaricatus* Schrank were founded upon the same plant—No. 1162 of Haller's *Hist. Stirp. Helv.* ii., 69, 1768. From this it is necessary to exclude Haller's var. *β.* which is *R. circinatus* Sibthorp (1794).

Chaix (*l.c.*) gives only, " *Ranunculus trichophyllus* (mihi) Hall. 1162 : in rivulis limpidis, Valgaud. Devoluy." Haller's description (*l.c.*) is as follows :—" 1162. Ranunculus caule fluitante, petiolis unifloris, foliis capillaribus, laciniis divergentibus. *Foeniculum aquaticum, tertium* Tabernaemont, p. 71. *Ranunculus trichophyllos, aquaticus, medio luteus* Columm. *ecphras.* p. 315, 316. *Ranunculus aquaticus, albus, Foeniculi folio* Barrelier, ic. 566. Frequentissimus in rivulis quietis, fossisque aqua plenis. A priori 1161 differt, flore minori, foliis nulla quidem certa figura circumscriptis, multo tamen brevioribus divergentibus. Flos similis : tuba maxima.

β. Foeniculum aquaticum, cornutum C. B. *Prodr.* p. 73. J. B. III., p. 784. *Ranunculus aquaticus, albus, cincinnatus, tenuissime divisis foliis, floribus ex alis longis pediculis innixis* Pluknet. p. 311, t. 55, f. 2. Circa *Nidau, Erlach, Mathod*, in fossis quietis. J. B. *Genevae*, C. B. in stagnis prope *Hiltelingen*.

Priori proximus, folia habet a caule parum recedentia, omnino circulari circumscriptione terminata, lobis densissime congestis imbricatis. Nolui tamen a 1162 separare."

A study of the views of Villars' contemporaries and earlier writers makes it quite clear that his name was intended to be composite and not segregate; that *trichophyllus* and *Drouetii* were never separated; that the aggregate plant was well known to all and was the plant described by Haller, whose description after all is the real type account of the name. It is therefore evident that 1162 (= *R. trichophyllus* Chaix in Vill.) = *R. trichophyllus* Ch. in Vill. emend. Godron in Gren. et Godr. *Fl. Fr.* i., 23, 1848, and *R. Drouetii* F. Schultz (*l.c.* i., 24). In this restricted sense *R. trichophyllus* is a well marked species, but differing considerably in the size of its flowers and submerged leaves. Floating leaves very rarely, if ever, produced. Stipules ½ to ⅔ adnate, large, rounded, and usually auricled. Submerged leaves with more or less rigid and divergent segments, sub-circular in outline or bush-like, commonly short. Flowers small as a rule, but not invariably so, with non-contiguous fugacious petals—up to twice as long as the sepals—white with yellow claw. Stamens few, often about 12 (9-15 Rouy), exceeding the carpels. Receptacle usually globular, often ovoid, rarely conical—sometimes varying much in the same plant—normally hairy. Carpels more numerous than in var. *Drouetii*, often crowded and therefore laterally compressed. When quite mature and well developed the upper half of the dorsal margin forms a quadrant, and the top of the carpel is slightly convex. Under less favourable conditions the top is nearly straight or with a trifling concavity near the lateral apiculus. The carpels are normally hairy, very rarely glabrous, beaked. Fruiting peduncles short—about 2 to 5 cm.—thick, not exceeding the leaves at time of flowering but may do so slightly in fruit: most curved near the base, the rest nearly straight, not or only slightly tapering, often bifurcate at the apex with two receptacles (cf. var. *Drouetii*).

DISTRIBUTION.—With a view to an ultimately complete record of the vice-comital distribution of the British Batrachia, I give herewith a list of the vice-counties from which I have seen specimens, and am very greatly indebted to Messrs W. P. Hiern, Jas. Groves, R. L. Praeger, C. Bailey, and Dr G. C. Druce for the use of their splendid collections, and for their generous help in other directions; to Prof. Johnson for the loan of the specimens in the National Museum, Dublin, and to Mr R. S. Adamson and Mr A. J. Wilmott for original records.

R. trichophyllus Chaix:—C, 1-11, 13-41, 48, 49, 53-60, 62-64, 66, 69a, 69b, 70; (Scotland) 72, 73, 75, 76, 77, 80, 82, 83, 86, 88-90, 98-105, 107, 109-112; (Ireland) 1-19, 21-26, 28, 29, 32, 33, 35-40.

It will be noted that many of the Welsh counties and some of those in North and East of Scotland are still unrecorded.

Var. DROUETII (F. Schultz). *R. Drouetii* F. Schultz in *Archiv. Fl. Fr. et Allem.* i., 10, 1842, sine descript. Lloyd in *Ann. Société des Sciences naturelles Charente-Inférieure*, 71, 1888; in Bull. *Soc. bot. rochelaise*, 26, 1889; in *Fl. de l'Ouest* ed. 5, 6. Corbiere, *Nouvelle Fl. Normandie* 21, 1893; Rouy et Foucaud *Fl. Fr.* 69, 1893. *R. paucistamineus* Tausch. F. Schultz in *Arch. Fl. Fr. et Allem.* 10 et 51, 1842.

R. Drouetii F. Schultz was first found near Angers by J. B. Drouet and communicated by him to F. Schultz, who named it *R. Drouetii* (*Arch. Fl. Fr. et Allem.* 10, 1842, without description). Koch, to whom the plant was also sent, identified it with *R. paucistamineus* Tausch, and Schultz published this latter name in his *Fl. Gall. et Germ.* exsiccata no. 404, but afterwards rectified it when Koch discovered that the plant differed from *R. paucistamineus.* This explains why Drouet has given in the *Arch. Fl. Fr. et Allem.* p. 51 the following description of *R. Drouetii* under the name *R. paucistamineus* Tausch. Description of *R. paucistamineus* Tausch by J. B. Drouet (*loc. cit.*):—"Tiges charnues, flottantes ou submergées, arrondies ou légèrement anguleuses, rameuses, allongées. Pétioles 3-fides, puis découpés en filaments nombreux, capillaires, mollement divergents; les supérieurs auriculés à la base. Pédoncules atteignant à peine ou dépassant peu les feuilles, réfléchis à la maturité. Fleurs petites (5-10 mm.), à pétales obovales, à peu près doubles des sépales glabres. Etamines 5-10, atteignant à peine ou dépassant peu les carpelles: stigmates falciformes. Carpels 5.25, petits, ovales-globuleux, brièvement ailés des deux côtés dans leur moitié inférieure, glabres jeunes, finement chagrinés luisants, murs, légèrement ridés transversalement, à bec très grêle ou nul. Réceptacle ovale ou un peu conique hérissé, soyeux."

The original description of *R. paucistamineus* by Tausch in *Flora* vol. xvii., ii., 525, 1834, is much too vague—" Batrachium; caule abbreviato natante, foliis omnibus immersis petiolatis capillaceo-multifidis, floribus minimis sub-12-andris oligocarpis, carpellis hispidulis obtusis."—but an examination of authentic foreign examples (and particularly those in Hb. Paris, for which I am indebted to Mr Jas. Groves) shows that *R. paucistamineus* Tausch is not synonymous with *R. Drouetii* F. Sch., but an aggregate species of much wider range—including *Drouetii*, *trichophyllus*, and even large forms of our var. *submersus* so long as the flowers are not too large.

In *Bull. Soc. Bot. Fr.* vol. 57, xxxv., 1910, M. Félix—the eminent French authority on the Batrachia—points out that the descriptions of *R. Drouetii* by Godron, Boreau, Du Mortier, etc., are much better known than Drouet's own description hidden in the *Archives Fl. Fr. et Allem.*, and attributed to an entirely different plant than *R. Drouetii*. It is from these varying descriptions that botanists have been trying to obtain a correct idea of Drouet's plant, and it is not to be wondered at that they have not succeeded. It has been left for Lloyd—*Fl. de l'Ouest* ed. 5, 6: *Ann. des sciences naturelles de la Char.-Inf.*, 71, 1888, et *Bull. Soc. bot. rochelaise* 26, 1889—to show the differences between *R. Drouetii* and *R. trichophyllus* and to fix, within the narrowest limits, the distinctive characters of the true *R. Drouetii* as authenticated by Drouet himself.

" *R. Drouetii* Schultz, exsicc. no. 404, Boreau, *Fl. du Centre*. Très voisin du *R. trichophyllus*, il en diffère surtout par les carpelles moins nombreux, glabres, lâches, c'est-à-dire espacés de manière que la moitié supérieure du carp. qui est renflée-arrondie, est tout à fait dégagée, tandis que dans *R. trichophyllus*, ils sont velus, serrés, comprimés, un peu aigus et imbriqués de manière à laisser voir seulement le côté extérieur du carpelle. Cette disposition donne à la tête de fruits un aspect différent, facile à distinguer. Les stigmates sont aussi plus étroits, en languette; dans *R. trichophyllus* ils approchent de l'ovale. Mêmes lieux que le precédent, auquel il est quelquefois mêlé, moins commun.

Obsr.—Plusieurs caractères auxquels les auteurs attachent de l'importance sont variables, ainsi : notre *R. Drouetii* n'est pas plus grêle d'un vert plus clair que l'autre, ses feuilles sont raides ou flasques selon la nature de l'eau, leur profondeur, leur situation ombragée ou non, les fleurs des deux espèces n'offrent pas de différence appréciable." (Lloyd, *loc. cit.*).

I have given the foregoing extracts at some length as they settle many points upon which both British and Continental botanists have been in doubt. It is clear that Drouet's plant possessed glabrous carpels, but unfortunately the term "glabrous" has been so loosely used by some writers that we are often not quite certain whether to understand it relatively or absolutely. However, the context makes it quite obvious that MM. Drouet, Felix and Lloyd intend the word to be used absolutely. In my own case it is always used in the same sense, and, on the contrary, if there are even a few hairs, the fact is stated.

Var. *Drouetii* is often difficult to separate from some forms of *R. trichophyllus*—as our past reports show. This is especially the case when dealing with robust specimens, for while the majority of British plants lack the rigid habit of that species and are relatively more slender, others are large and stout. Little reliance can be placed upon colour in separating these plants, although *Drouetii* growing in clear water is usually lighter green than *trichophyllus* under similar conditions, but it may be dull greyish-green, often olive, or even madder (in peat). There are no floating leaves. The submerged leaves are normally sessile or sub-sessile—upper often distinctly petiolate—with segments weak and collapsing or "feebly divergent" when taken out of the water. (Mr James Groves informs me that in Drouet's original specimen (Hb. Paris) the segments are distinctly diverging.). This character is often masked by incrustations of lime, mud or slime; and varies, too, with age. Upper stipules much adnate, often large and auricled. Flowers rather small, but seldom as small as those of *trichophyllus*; usually the narrow oboval petals are about twice the dark glabrous sepals. Stamens few—often about 10—variable in length, sometimes not exceeding the head of carpels. Receptacle usually oval or conical, longer than broad, invariably hispid. Fruiting peduncles relatively slender, short, normally not exceeding the leaves, sometimes bifurcated at the apex, with two receptacles. Carpels slightly less numerous and more stubby than in *trichophyllus*, oval or oboval, inflated upward, much rounded at the summit, normally glabrous or with a few hairs, occasionally with many.

DISTRIBUTION.—C, 1-17, 19-30, 32-39, 41, 49-52, 54-71; (Scotland) 73-76, 79, 82, 83, 86, 88-90, 95-106, 108-111; (Ireland) 2, 12, 16, 18, 19, 21, 23, 26, 27, 31.

Var. RADIANS (Revel), in *Act. Soc. Linn. Bordeaux*, xix., 120, fig. 1, 1853. The original description is:—" Caule fistuloso ramoso natante. Foliis submersis petiolatis multifidis laciniis capillaribus divergentibus, flaccidis, fluitantibus rotundato-orbiculatis, profundè divisis, infernè pilosis, cum segmentis radiantibus, primùm dentato-lobatis, deindè, plantâ ætatem adultam adeptâ, laciniatis et tunc plerumque petiolulatis. Petiolis basi dilatatis, in vaginam membranaceam pilosam adhærentem plus minus auriculatam abeuntibus. Pedunculis foliis brevioribus vel subæqualibus. Calice patente. Petalis obovato-cuneatis calice duptò circiter longioribus, albis, ad unquem flavis. Staminibus sub-18 ovariorum capitulo longioribus. Carpellis numerosis transversè rugosis plus minus apice (infernè tantum) hirtis, lateraliter compressis, obovatis, cum carinâ inferiore-valdè convexâ, superiore verò basin versùs depressiusculâ, versus autum rostellum convexâ, rugis ad depressionem convergentibus: rostello mediocri, crasso, obliquè adscendente, paulò suprà extremitatem externam diametri longioris fructûs inserto. Receptaculo sphærico densè setoso."

" Tige fistuleuse, rameuse, nageante. Feuilles submergées pétiolées, multifides, à laciniures capillaires divergentes molles, les flottantes arrondies circulaires, profondément divisés, poilues en dessous, à segments rayonnants, d'abord dentés-lobés, ensuite, dès que la plante est arrivée a l'état adulte, laciniés, et dans cet état ordinairement pétiolulés. Pétioles dilatées à la base en une gaine membraneuse, adhérente, velue, plus ou moins auriculée. Pédoncules plus courts que les feuilles ou les égalant à peine. Calice étalé. Pétales obovates cunéiformes, égalant deux fois environ 'a longueur du calice, blancs à onglet jaune. Etamines (15 à 18), plus longues que la capitule formé par les ovaires. Carpelles nombreux, ridés transversalement, plus ou moins velus au sommet en dessous, latéralement comprimés, obovales, à carène inférieure très convexe, la supérieure un peu déprimée vers la base et convexe dans la partie qui avoisine le style; rides convergeant vers la dépression. Bec médiocre, épais, obliquement inséré un peu au-dessus de l'extrémité extérieure du grand diamètre. Réceptacle sphérique, hérissé de poils épais.'' (Revel, *op. cit.*).

Later, Revel amended this description in his *Renonc. de la Gironde*, 8 et icone—and cited by A. Boreau in his *Flore du Centre de la France* ed. 3, ii., 11, 1857. In this he described the segments of the subm. ls as '' divergentes en circle ''—a character well shown in some British specimens. In his *Flore du Sud-Ouest*, Revel further modified his opinion of the receptacle, which is there described as '' ovoid.'' In my own experience this is the more common form, but it is remarkable how often—even on the same plant, the receptacle is nearly spherical or—on the other hand—distinctly longer than broad (cf. also *R. trichophyllus*).

R. radians Revel was first recorded as a British plant by Mr W. P. Hiern at the annual meeting of the British Association in September 1865. His plants were gathered in June 1864 at Silverdale, W. Lancs, and among his MSS. is a letter from A. Boreau (6/7/1865) having reference to one of these plants. Of this Boreau says '' the foliage is absolutely the same as that of a plant I possses so named by Revel himself.'' So far as my own examination of authentic continental specimens goes, it confirms the claim of Mr Hiern for *R. radians* as a British plant. Babington (*Manual* ed. 9, 6) and Hooker (*Stud. Fl.* ed. 3, 6) considered the plant a form of *R. trichophyllus* with floating leaves. Moss (*Journ. Bot.* lii., 117, 1914) follows Rouy and other Continental botanists in giving it varietal rank. At present I accept this view, but the more specimens I examine, the more I lean to the opinion so forcibly expressed by M. Felix in his Monograph on the Batrachia—*Bull. Soc. Bot. France*, vol. 60, p. 260—that *R. trichophyllus* never possesses floating leaves and that *R. radians* is a distinct species. He says, '' *R. trichophyllus* only possesses capillary leaves. Never—and I insist on the word—never have I seen it, either living or in herbaria, with floating leaves.'' At any rate, all the British forms of the so-called *R. trichophyllus* with floating leaves which I have examined are without difficulty referred to var. *radians* (Revel), var. *triphyllus* (Hiern), or *R. heterophyllus* Weber. I entirely dissent from the view (*Camb. Brit. Fl.* vol. iii.) that it is possible to include under

R. trichophyllus what British botanists now accept as *R. heterophyllus* and *R. penicillatus*—forms which differ not in degree but in kind from *R. trichophyllus.*

A large plant having the facies of robust *R. trichophyllus.* All leaves are usually ± circular in outline, symmetrical in segment and regular in arrangement—a beautiful plant when carefully dried. Floating leaves rather thick, coriaceous, often hairy beneath and on the petioles; normally sub-circular, deeply divided into cuneate segments separated by radiant straight-sided sinuses, often extremely narrow, rarely very wide; basal sinus large and deep or narrow as the others. Occasionally they are reniform, tripartite, or even fan-shaped, having segments laciniate and petioled, or transitional. Submerged leaves usually dark-coloured, sub-circular in outline, regularly disposed, with short, ± rigid, diverging segments like those of *R. trichophyllus*; smaller than in var. *triphyllus*, more compact and much more uniform in shape and arrangement. Not "commonly petiolate" but often nearly sessile, the petiole being shorter than its stipule. Occasionally, when submerged leaves are developed to the summit of the stem—in place of floral leaves—they are longly petiolate. Flowers medium-sized, much larger than those of *R. trichophyllus* and approximating to those of *R. heterophyllus* Weber. Fruiting peduncles usually very short (upper often about 2 cm. with lower longer), much shorter than the floating leaves they may subtend—occasionally nearly equalling them—rigid, strongly recurved below, nearly straight above, often at right angles to the stem. Receptacles spherical or ovoid, densely hairy with long hairs. The young carpels taper upward—both the dorsal and ventral margins being slightly concave—giving the upper part a "bottle-neck" appearance. This largely disappears in mature fruit, but the dorsal margin usually retains a slight depression at the top which causes the carpel to be "narrowed above," and so readily distinguished from that of *trichophyllus.* "The carpels are ± numerous—reduced to 8 or 10 in certain forms. The depression in the upper keel is nearly insensible when their number diminishes." (M. Felix, *Bull. Soc. Bot. Fr.* vol. 60, 1913.). In this country invariably hairy, but a glabrous form has been found in France.

Distribution.—I have seen specimens from the following counties or vice-counties :—England, 5, 6, 9-11, 12, 13-17, 20-24, 26-29, 31, 33, 34, 36-41, 50, 51, 55-58, 60, 69b. Scotland, 75-77, 80, 81, 85, 86, 89, 90, 97-105, 110. Ireland, 1, 16, 18, 21, 23, 26, 31, 34, 39.

Typical specimens are those from (1) Silverdale, W. Lancs, 15/6/65, W. P. Hiern, (2) Thame, Oxon, May 1915 [Ref. O. 815], G. C. Druce, (3) Nailsea Moor, N. Somerset, 19/6/1900, and (4) Marsh ditches, Yatton, N. Somerset, 13/6/1900, J. W. White, (5) Quarry pool, Wickwar, W. Gloster, May 1915, J. W. White. See *Rep. B.E.C.* 311, 1915. Mr White subsequently sent me representative sheets which left no doubt as to the identity of this plant.

f. GODRONII, nov. comb. *R. Godronii* Grenier, in F. Schultz *Arch.* 172, 1850, name only. Form 19, *Godronii* Hiern, *l.c.* 1871. The adoption of this name is unfortunate, as having been first published without description and subsequently abandoned by Grenier himself in favour of *trichophyllus*. In my opinion, however, the plant seems much nearer to var. *radians* than to either *R. trichophyllus* or var. *Drouetii*, under each of which it has been placed. In many cases it is difficult to separate from var. *radians* except by its less robust habit and weaker submerged leaves, and appears to be best regarded as a slender form of that variety. Boreau, *op. cit.* puts it under *R. radians* and notes the following differences, " Le *R.* (*Batrachium*) *Godronii*, me semble différer par des proportions plus grêles, les fleurs moitié plus petites, les carpelles moins nombreux, à carène plus amincie." Floating leaves when well developed nearly circular, but less regularly divided and usually smaller than those of *radians*. More often, however, they are somewhat semicircular in outline and truncate at the base, or with stalked and variously fissile fan-like segments. The submerged leaves may have either weak and sub-collapsing, or rigid and divergent segments. In the latter case they are always more irregular in form and arrangement than in *radians*. Usually ± petiolate and often having segments distinctly flattened and linear. Peduncles shorter than, or about equalling, the leaves, slender, often narrowed above. Receptacle ± rounded (occasionally rather long), and hairy. Carpels hairy as a rule, or nearly glabrous, often narrowed above. Flowers commonly small with petals up to 6-7 mm., thin in texture, faintly veined. Typical specimens were distributed by Miss I. M.

Roper from Farnborough Common, Marksbury, N. Somerset, 20th May 1918, through the *W.B.E.C.*

Distribution.—England and Scotland:—4, 6, 10, 15, 17, 20, 21, 25, 29, 30, 34, 36, 38, 39 (unrecorded from Wales), 56. 58, 62-64, 75-77, 80. 86, 90, 97-105, 110, 111 (cf. with *radians*). Ireland:—5, 19, 23.

R. tripartitus DC. Icon. Pl. Gall. Rar. i., 15, t. 49. 1808. *R. tripartitus*, a. *micranthus* DC. Regn. Veg. Syst. Nat. i., 234, 1818. *Batr. tripartitum* S. F. Gray, Nat. Arr. Br. Pl. 2, 721, 1821. *R. hydrocharis. A. heterophyllus*, γ. *tripartitus* Spenn. Fl. Frib. 1829.

The name *tripartitus* has been given to at least 5 different plants, (1) *R. tripartitus* DC. (2) *R. tripartitus* Auct. Brit. = *R. lutarius* Bouvet = *R. intermedius* Bab. non Knaf. (3) *R. tripartitus* var. *obtusiflorus* DC. = *R. tripartitus* Nolte (both cited by Koch as synonyms of *R. Petiveri*) = *R. Baudotii* (Godron ampl.) Syme E. B. i., 24. 1863. (4) *R. aquatilis* var. *tripartitus* Koch Syn. ii., 1835 = *R. Petiveri* var. *major* Koch Syn. iii., 10, 1843 = *R. triphyllos* Wallr. (5) *R. tripartitus* Dubourg d'Iisigny = *R. Lenormandi* F. Schultz.

A rare and critical species. Stem 1-5 dm., extremely slender, but comparatively strong, simple or slightly branched. Floating leaves bright green and shining when fresh, forming a rosette on the surface of the water, and readily distinguished by their colour from those of *R. lutarius*. When dried they become either yellowish (or brownish)-green. Small—often extremely so—symmetrical, with long (3-5 cm.), and very slender petioles; deeply and regularly divided into 3 cuneiform segments separated by relatively wide sinuses with nearly straight sides. Segments very regular in outline—with 3 or 4 rounded crenatures—central segment usually as long as the lateral and only slightly smaller, with 3 rounded crenatures, or, in very small leaves, entire. Submerged leaves few, distant, extremely slender; when normally developed having remarkably fine, truly capillary, segments—yet usually ± divergent, but sometimes completely collapsing. Stipules well-marked, often conspicuous, delicate, transparent, with large auricles; upper with free or nearly free rounded ends. Flowers minute and inconspicuous. Petals minute (3 mm.) oblong, rather acute at the apex, equalling or scarcely exceeding the calyx, very fugacious. Fruiting peduncles very slender, usually shorter than or equalling the leaves, not or slightly tapering, ultimately recurved. Receptacle very small, roundish, hairy. Carpels few, obovate; when mature and well-developed most inflated at the top and often having the small lateral mucro below the summit of the carpel. More frequently, however—especially in specimens gathered too early—the carpels are most inflated in the middle and slightly narrowed at the tip; very rugose, glabrous and sometimes sub-petiolate

DISTRIBUTION.—In England only from W. Cornwall (1), E. Cornwall (2), and S. Devon (3). In Ireland only from Co. Cork.

I have seen the following authentic specimens:—(Hb. Groves)—W. Cornwall, Mullion, J. Cunnack, 1879, E. Cornwall, Innes Moor, near Roche, R. V. Tellam, 1876; near Wadebridge, Clement Reid and Dr Vigurs, 1906. Co. Cork, Baltimore, R. A. Phillips, 1896.

(Hb. Hiern)—E. Cornwall, Innes Moor, near Roche, R. V. Tellam, June 1877. W. Cornwall, Kynance Down, The Lizard, Miss R. E. Carr Smith, 30th May 1910. S. Devon, Knighton Heath, Hennock parish, Miss C. Ethelinda Larter, F.L.S., 9th May 1914; and from same station, W. P. Hiern, M.A., 29th April 1916.

(Hb. Barton)—E. Cornwall, ditch at Castle Killibury, Wadebridge, C. C. Vigurs, 19.6.07. Miss C. E. Larter very kindly sent me fresh specimens from the S. Devon station in May 1920.

R. LUTARIUS Bouvet in Bull. Soc. Angers for 1873, 96, 1874. *R. tripartitus* Auct. Brit. *R. lutarius* Bouvet, fide H. & J. Groves in Journ Bot. xlv., 452, 1907. Form *intermedius* (Hiern) in Journ. Bot. ix., 67, 1871, excl. syn. Knaf. *Batr. intermedium* Nyman Syll. Fl. Europ. 175, 1854-5. *Batr. lutarium* Revel in Act. Soc. Linn. Bordeaux xxv., 413, t. 4, 1865. *R. intermedius* Bab. Man. ed. viii. *R. lutarius* (Bouv.) Bab. Man. ed. ix., 1904 (H. & J. Groves). Revel's description (*l.c.*) is as follows:—" Tige fistuleuse, rameuse, rampante, vivant dans le limon, radicante, attachée au sol par de longues fibrilles radicales, opposées aux feuilles, celles-ci toutes reniformes, au peu arrondies orbiculaires, émarginées, presque jusqu'au milieu, à bords de l'échancrure tantot éloignés tantot rapprochés et presque contigus, lobés à 3-5 lobes crénelés, ordinairement non contigus à la base; surface inférieure des feuilles parsemmé de quelque poils apprimés, ou glabres; petioles dilatés à la base en une gaîne membraneuse, adhérente, auriculée, inserés en dessous des feuilles, à la base de l'échancrure; pédoncules plus courts que les feuilles, ou les égalent à peine; sépales obtus, scarieux, étalés; pétales obovales en cous, egalant deux fois et demi environ la longuer du calice, blancs à onglet jaune; carpelles nombreux, ridés transversalement, latéralement un peu comprimés, obovales, à carène inférieure très convexe, la supérieure presque droite, un peu convexe dans la partie qui avoisine le bec; rides sinueuses, brisées, un peu courbées, bec médiocre, obliquement ascendant, recourbé à partir du milieu mais ordinairement écourté par le milieu à la maturité des carpelles, inséré au peu au-dessus de l'extrémité du grand diamètre; réceptacle sphérique, herissé de poils. Mai, Juin. Terrain limoneux.

Obsv.—La présence des poils que l'on remarque quelquefois sur les sépales, sur les pédoncules, sur les pétioles et sur leurs oreillettes, ne m'a pas paru assez constante pour an faire mention."

In the *Cambridge Flora* vol. iii., Dr Moss includes *R. lutarius* (? Bouvet *loc. cit.*) = *B. lutarium* Revel (1865), under *R. tripartitus* DC. He admits (*Journ. Bot.* iii., 116, 1914) that he has seen no authentic specimen of Revel's plant, and from other indications it is apparent that he is unacquainted with it. Moreover, it is difficult to understand why he should query the author's name. In *Journ. Bot.* xxxviii., 135, 1900, Messrs H. & J. Groves say, "We are indebted to Herr Freyn for suggesting the identity of the British plants with *B. lutarium* Revel, described and figured in *Act. Soc. Linn. Bord.* 1865 (p. 413, pl. 4). We have compared them with specimens of *B. lutarium* from the original locality (La Teste, Gironde), and we feel satisfied that they are the same. Revel's species was, as far as we have ascertained, first placed in *Ranunculus* by M. Georges Bouvet, and M. Bouvet has kindly given us the reference to the original publication of the name in *Bull. Soc. d'Etudes scient. d'Angers* for 1873 (1874) p. 96." The name, therefore, should stand, and as the plant is, in my judgment, quite distinct in character and distribution from *R. tripartitus* DC., it is entitled to the specific rank originally accorded it.

A much more robust plant than the preceding. Stem fistular, usually much branched, glabrous except at the nodes and rooting at the lower of these. Floating leaves resembling those of *R. tripartitus* DC., but larger (up to 1 inch wide), reniform or three-fourths circular, less deeply divided into broader segments having markedly rounded edges. Segments 3, large, symmetrical, cuneate-obovate, central usually only slightly less than the lateral, broad at the top (with 3 nearly semi-circular crenatures), narrowed below. Each lateral segment (usually with 4 similar crenatures) separated from the central by a narrow sinus. Lower surfaces sparsely covered with adpressed hairs, or glabrous. Submerged leaves commonly absent, rarely present, then few in number, less frequently forked and having rigid segments distinctly flattened, of an appreciable width and ± diverging. Usually there are some transitional leaves present also, and these I have not seen in *R. tripartitus*. Stipules large, well-developed and conspicuous. Flowers very small for so robust a plant, with small, narrow oboval petals, up to 2ce the sepals, when well-developed 6 mm. long, but usually less. The colour of the petals is white—often pinkish when dried—with yellow base. If held up to the light and looked through they often appear nearly "wholly white," and may be mistaken for those of *R. ololeucos*, but placed upon absolutely white paper and seen by reflected light, the yellow tinge of the lower portion is at once apparent. Stamens very few (6-10) about equalling the head of carpels. Fruiting peduncles usually much shorter than the leaves, ultimately recurved. Receptacle more or less hairy. Carpels fairly numerous, unequally obovate, much inflated above, regularly and strongly wrinkled transversely, keeled, with a prominent terminal beak (lateral or nearly central); glabrous.

Distribution.—In England from all the counties south of a line joining Bristol Channel and the Thames estuary—excepting Somerset and I. of Wight—*i.e.*, 1-4, 7, 8, 9, 11, 14, 15, 16, 17. In Wales, from Glamorgan 41, Brecknock 42, Pembroke 45, and Anglesea 52.

MISCELLANEOUS NOTES.

"ALPINE FLOWERS FOR SNOWDON. A large tract of land on the Llanberis, Carnarvonshire, side of Mount Snowdon, has been planted with Alpine plants and seeds. 'The experiment,' said Mr T. R. Bulley, 'is to be continued every year until the greater part of Snowdon is covered with Alpine flowers. It is to be hoped that tourists will help us by not tampering with them.' Chinese rhododendrons are to be planted on the slopes of Snowdon next spring." The above notice recently appeared in a newspaper. Assuming that this appalling act of vandalism has been perpetrated which must shock every British field botanist and student of phyto-geography, we implore the misguided enthusiast to stay his hand and, at once, assuming he has any knowledge of the seeds or plants he has put there, to furnish a complete list of them so that the mischievous act may, as far as possible, be lessened in its evil consequences. Doubtless Mr Bulley is unaware of the harm he has done. Snowdon is a splendid area, hitherto free from adventive species, and although much visited its flora is as yet not perfectly known as is evinced by the comparatively recent discovery on it of *Euphrasia hirtella*. In the future any new plant found in its area will have its indigenity doubted through this stupid interference with nature. The recent discovery of *Aquilegia alpina* in Caenlochan Glen, Forfarshire, is robbed of its possible value because some florist years ago acknowledged he had sown seeds of alpines there. This prevented myself and others for years from exploring its splendid cliffs, which may hide some unrecorded species. Surely the keepers of the London parks could find a place for this superfluous energy, and there are grounds at Hanwell and similar establishments, not to speak of sea-cliffs at Bournemouth or Torquay already planted with exotics, where these additions, which are absolutely out of place on a British mountain, might find a more or less temporary home.

NATIONAL TRUST FOR PLACES OF HISTORIC INTEREST OR NATURAL BEAUTY. Report 1920-21. 25 Victoria Street, Westminster. This splendid Society has acquired the option of purchase of Friar's Crag, Derwentwater, and about 8 acres of Scarf Close Bay for the sum of £2300 as a memorial to Canon Rawnsley. Cissbury Ring, for which £2000 is still required, it is to be hoped may also be secured. Miss Chichester has given an additional 97 acres at Morte Point in memory of her parents, the late Sir Alexander and Lady Chichester. A field at Mount Pleasant, near Clovelly, has been given by Mrs Hamlyn in memory of the men at Clovelly who fell in the great war. The common rights of Witley Common, Surrey, an area of 240 acres. have been presented by Mr Thackeray Turner and his daughter The Cerne Giant, near Cerne Abbas, Dorset, has been given by M. Pitt-Rivers. Gover Hill, Kent, has been presented by Sir William Geary, and Stoke Poges, Bucks, where there is a monument to Gray, and some acres of adjoining land, are to be handed over by Sir B. Oppenheimer and Mr W. A. Judd. Some additional land at Waggoner's Wells, Haslemere, has been presented by Mrs Vertue. A bequest by Miss Theodora Powell of £5000 enabled the Trust to complete the purchase of Eastbury Manor House, near Barking.

The inaugural meeting of the Indian Botanical Society was held in January 1921 under the historic Banyan Tree in the Calcutta Botanic Garden. Eighty-one original members were enrolled, the President being Dr Winfield Dudgeon.

KEN WOOD. This beautiful estate of Lord Mansfield at Hampstead has been offered for sale at £340,000. It comprises about 220 acres and includes the fine mansion. To botanists the grounds have a great attraction for the May Lily, *Unifolium bifolium* has been naturalised there for many years, and *Anemone apennina* is semi-wild.

BURNHAM BEECHES. About 70 acres of woodland adjoining this favourite piece of ground has been recently presented by Lord Burnham.

THOMAS CAREW HUNT, Consul at the Azores. H. C. Watson, in Godman's *Natural History of the Azores* p. 117, says, " The zealous and intelligent exertions of Mr Hunt in the years 1844-48 conduced much to the increase and to the diffusion of knowledge about the Botany of the Isles. He most kindly collected for me, and for the (then flourishing, since extinct) Botanical Society of London, a very large supply of Azores plants, chiefly from the island of his own residence, San Miguel, thus excellently supplementing my own unsatisfactory collection by the number and goodness of his own specimens. . . . These specimens were promptly distributed into British, European, and American Herbaria. Their labels were filled in by my own pen and all bear the same numbers on them and the same names with few exceptions . . . as had been used on my earlier labels. Mr Hunt's added species, of course, would have no corresponding number; they usually bear the abbreviation 'Add.' instead." Some corrections were made in or about 1848. The later labels are more to be trusted as to the identifications than the earlier labels of 1843 or of Hunt's in 1844 or 1845. Since the issue of the supplementary list several additional species have been sent by Mr Hunt, who has himself published some botanical account of the Isles in the *Journal of the Geographical Society of London* in 1845. Watson says Mr Carew Hunt went from the Azores to Stockholm. Thus it will be seen Carew Hunt gave plants to our forerunners, the Botanical Society of London, for distribution, and that H. C. Watson sent them to the members. At the meeting of the Society, July 7, 1848, a number of plants presented by T. Carew Hunt was announced as containing eight species not previously ascertained to grow in the Azores, and on November 3 of the same year he sent a box containing, among other plants, four new species including a very handsome *Vicia*. In the *Gardeners' Chronicle* 119, 1921, an account is given of the discovery of an interesting Herbarium which was found in the city warehouse of Messrs Joseph Barber & Co., of the Minories. The case containing it had been originally consigned to the Botanical Society of London. Attached to it was a label giving the name of the collector, Mr Carew Hunt, the name and place of finding the plants, and the date of its collection, 1834. The case was offered to the Royal Botanic Society, an entirely different body to the Botanical Society of London to which it was consigned so long ago as 1834. The collection was then, by the advice of the Committee, offered to Kew, where it was warmly welcomed by Colonel Sir David Prain. It is somewhat remarkable that a herbarium of so old a date should have remained unnoticed and undamaged in a London warehouse. Some of the plants recorded by Hunt await rediscovery. On my visit to the Isles in 1909 I refound, among others, *Trifolium angustifolium* and *Urospermum Picroides* at Ponta Delgada, and *Tillaea muscosa*, which had escaped the notice even of the local botanist, Dr Carreiro. I saw it not only at Ponta Delgada, but in the Furnas and at the Sete Cidades. The beautiful Vetch alluded to at the meeting of the London Botanical Society was named by H. C. Watson after its secretary *Vicia Dennesiana*, an endemic species.

BOOKS IN PREPARATION.

The Flora of Cornwall, under the auspices of Mr E. Thurston, C.I.E., with the additions to Davey's *Flora*, we are pleased to hear, will shortly be issued.

The Flora of Surrey, by Mr C. E. Salmon, will, it is to be hoped, appear in the near future.

The Flora of Buckinghamshire, by Dr G. Claridge Druce, is in the press, and will be published by Messrs T. Buncle & Co.

British Flowering Plants. Another volume, with paintings by Mrs Perrin, F.L.S., is in preparation.

Wild Flowers of the British Isles, by Mrs I. Adams, F.L.S. A third volume of this attractive work is contemplated at no distant date.

SUPPLEMENT TO REPORT OF BOTANICAL SOCIETY
AND EXCHANGE CLUB FOR 1921.

FLORA ZETLANDICA.

BY

G. CLARIDGE DRUCE, M.A., LL.D.

PREFACE.

This remote group forms a northern archipelago of more than a hundred islands, of which nearly thirty are inhabited. It lies between the latitudes of 59.51 degs. and 60.50 degs., and from 1.15 degs. to 45.30 degs. longitude, having a land area of about 1475 square kilometres. Only about a twentieth part is under cultivation. The largest island, The Mainland, is about 60 miles long from Sumburgh Head in the south to Feddaland in the north, but is so narrowed near Sullum Voe as to be almost severed. The islands are about 70 miles from the most northern of the Orkneys, 130 miles from Cape Wrath, and 220 miles from the Faroes, with which they have much in common. The Faroes have about 17 inhabited islands, which stretch from north to south about 90 miles. Their land surface is nearly the same as that of Shetland, being about 1325 square kilometres. They differ much in the geological structure as basalt is largely present in the Faroes, and their hills are higher. Slattaratind on Ostero reaches nearly 2700 feet, as against Ronas Voe in Shetland, which is less than 1500 feet, and there are many hills about 2500 feet. That may, in part, account for the presence of some Saxifrages, Sedges, and Alpines which are unknown in the Zetlands.

The question arises:—How did the existing vegetation of these groups of islands, situated as they are at such a distance from the mainland of Scotland and Scandinavia, reach them after the glacial period? Various theories have been formulated, but the two which have obtained most favour are—(1) The existence of a post-glacial land-bridge from the mainland. Dr Ostenfeld has most ably presented this, but it has not received the universal support of geologists; and (2) that of immigration by means of birds, ocean currents, and wind. The latter, with modifications, has been ably urged by Dr Warming (*Botany of the Faroes* 660-681). In favour of this is the very restricted distribution of many species in both groups. Doubtless, as compared with the oceanic groups of the Azores, Madeira, and the Canaries, which were out of reach of glaciation and which are rich in endemic species, these northern groups have a much more recent flora as is evidenced by the few instances of endemism which they afford, except in the micro-species of Hieracia. Doubtless at one time the land-surfaces of the Zetlands and Faroes were more extensive, as the winds and waves have taken a heavy toll, but there is no evidence of a post-glacial land union. Neither toads nor reptiles are found in the Faroes, that also being an argument which tells against the existence of a land-bridge. Warming instances the volcanic island, Jan Mayen, which is separated from Greenland by 450 kilometres, from Iceland by 550 kilometres, and from Spitzbergen by 965 kilometres, and is surrounded on all sides by a very deep sea (1000-2000 fathoms), and yet it has been occupied by a small number of species having a wide arctic distribution, and these must have been conveyed across greater distances of sea than those which separate the Faroes and the Zetlands from the mainland of Scandinavia and Britain. The Azores and Krakatoa offer similar examples, and Warming alludes to the occurrence of the North American *Eriocaulon* in the West of Ireland and Skye. He places little stress on bird-conveyance as a means of transport, but I think he minimises its effects. In what other way could *Elodea* have spread with so great rapidity through Britain even into remote ponds and tarns? Warming shows that wind has transported *Calluna* seeds across the Kattegat, a distance of 120 kilometres, and Meunier records that fragments of chalk were blown by the wind for a distance of at least 150 kilometres near Paris. There is, however, a still more important factor in the introduction into both groups of islands of plants from the mainland—that of man and his operations. A very large percentage of species in the Zetlands are due to this cause. We need only allude to plants which in Britain are assumed to be native, such as *Ranunculus Ficaria*, *R. repens*, *Bursa pastoris*, *Raphanus Raphanistrum*, *Spergula sativa*, *Hypochoeris radicata*, *Senecio Jacobaea*, *Myosotis arvensis*, *Lycopsis*, *Phleum pratense*, *Arrhenatherum tuberosum*, etc. In reference to this I may add that the specimens of Shepherd's Purse which I collected in two or three localities in Shetland and Unst presented no appearance of endemism but were easily referred by Dr Almquist to *anglica* and *belgica*, and were doubtless brought in by man. The solitary patch of Water Cress and the colony of *Crepis capillaris* are almost certainly recent introductions, and we see how the American *Matricaria suaveolens* and *Mimulus* have spread. That many plants when once introduced do not spread more rapidly is due to the fact that the short summer with its low temperature does not allow the fruiting processes to be completed. I was again and again told that the seasons are now more severe than in olden times, and that formerly more fruit was observed on *Vaccinium Myrtillus* and *Empetrum* than is now the case. *Pyrus Aucuparia* now rarely flowers. Warming thus summarises his views:—Taking everything into consideration, I am fully convinced that the whole of the Faroe flora—at least all the more highly organised land plants—have immigrated after the glacial period across the sea, and from the nearest countries, lying east, especially Great Britain. If this be true of the Faroes it must be still more applicable to the Shetlands, which, with the exception of a hybrid Pondweed, of a recently segregated *Rhinanthus*, of a few critical *Hieracia*, and the *Plantago Edmondstonii*, now described, possess no species which is not found on the mainland. In passing one may add that the mean rainfall, about 43 inches (much less, indeed scarcely half that of the Faroes), is misleading since the clouds are absent from the sky only on a few days of the year, that mists are very frequent, and therefore there is great humidity, and the solar light is of feeble intensity. The larger size of the flowers of many Shetland plants has been attributed to the length of daylight. May not its comparative obscurity be an influencing means? That the size or brilliancy of the flowers is due to the desire to attract insect visitors can hardly be urged since there are few lepidoptera, and many plants are self-fertilised, and others never ripen seed. The true cause of this exceptional size of the flowers in the case, among others, of *Lathyrus pratensis*, *Vicia Cracca*, *Trifolium repens*, *Lotus corniculatus*, and *Senecio aquaticus* has yet to be ascertained, and help may be given by the bio-chemist. Their size may, in part, be due to the angle of incidence of sunlight, but it occurs not only in the case of upland but also with coastal plants. Another fact in connection with Zetland is the comparative paucity of annual species. There seems to be a tendency for an annual species to extend its life duration so that *Poa annua* may be seen as a perennial. The weather of the islands is bad—rain, mist, and wind occurring in continual cycles. In the Faroes the cloudless days in a year are only 6, while the sky is overcast on 178. Rain falls on 279, and there are only 11 days of calm. The Zetlands have a slightly better weather record. One must not leave this topic on such a pessimistic note. I have had three cloudless or well nigh cloudless days—one at Burrafirth, when we explored the caves, and searched vainly for the Sea Pea. The great fiord was a magnificent sight. The huge cliffs of Saxavord were alive with sea birds, thousands of quaint puffins so tame as to acutally allow one to touch them with a stick ere they whirred off into the bright air like a toy torpedo, myriads of guillemots, black cormorants, snowy kittiwakes, the graceful terns and skuas, those pirates of the sea. Again and again, when a tern had captured a fish, he was attacked in swift relentless curves of flight by a pair of Richardson Skuas until, with a protesting scream, the fish was dropped, to be captured ere it reached the water by the voracious free-booter. Often our boat was surrounded by seals that were frolicing about enjoying the vivid light and warmth, their heads rising above the surface like a retriever dog. The sea itself was of a glorious hue—the colour of the blue of a steel saw, and the white surge breaking on the black rocks was of crystalline purity. Then landward the yellow sands were glowing bright, here and there showing patches of *Vicia Cracca* of an indigo tint. Above them, on the dull green slopes, were thousands of kittiwakes, who take their bath in the fresh waters of the Loch of Cliff, and then dry themselves on the grassy slopes before going out again to sea. To the west rises the hill of Hermaness, the sanctuary of the Great Skua, who much resented our visit to his domain, and here on the sea cliffs in a few places grow the Honeysuckle and rare Hawkweeds.

Our second brilliant day was in the south of the Mainland at Sumburgh Head, where to the west looms up the dark headland of Fitful Head, and close by is Jarl's House. All about in the sand dunes were the pale lilac stars of a Gentian, patches of the deep blue-flowered *Vicia Cracca* and large golden-flowered *Lotus corniculatus*, the local name of which is *Taegirs*. Few places more beautiful in these conditions exist than Loch Spiggie and the adjacent bay, since not only is there loveliness of coast outline and splendid cliffs, but the sea excelled even the famed Littoral in the purity of its azure, and here had none of the artificial surroundings to detract from its charm. A third wonderful day was a motor ride from Lerwick to Tingwall, Scalloway, Walls, and Sandsting towards the island of Papa Stour, when there was a continued succession of splendid sea views, fiord after fiord coming into sight, and the hill slopes showed such a multitude of Euphrasias in most magnificent colouring with *Gentiana campestris*, Marsh Orchids, and wonderful *Trifolium pratense* and *Lathyrus palustris* as one never expects to see again. Such days repay the visitor for many hours of monotonous dreariness, and they remain in one's memory while others are forgotten.

I must take this opportunity of thanking Mrs Saxby, the sister of Thomas Edmondston, for her kindness, and to recommend the little volume on the Shetland Flora which her son prepared, and which has an appreciation of Edmondston from her facile pen. To Dr Saxby, as well as to Mr John Campbell of Lerwick, Mr Henderson of Belmont, Sir W. Cheyne of Fetlar, and Mrs Saxby of Dunrossness I am indebted for kindness; and to my companions, the Rev. Prebendary Burdon, Mrs Wedgwood, and T. Churchill for ready help.

G. C. Druce.

INTRODUCTION.

Tate (*Journ. Bot.* 14, 1866) gives the flora as consisting of 364 indigenous species and 14 varieties.

Beeby, who made 340 gatherings (*Scot. Nat.* 25, 1891), gives the number of plants seen in his five years' investigations as 365, all of which are represented in his herbarium. He saw dried specimens of 15 other species, making in all 380. He says about 30 other species have been recorded but are doubtful. This would bring the number to 410. He thinks that further investigation may bring the total to 450 species. About 75 are also on record which are either casual or erroneous. In five or six subsequent visits between 1891 and 1907 Beeby added 38 species to the foregoing total of 380.

William West catalogued 221 species, 8 planted and 4 varieties. 167 were noticed for Unst and 173 for the Mainland. West added about 3 species to the flora. He also gives *Juncus glaucus* and *Lychnis alba*, which need confirmation.

Ostenfeld (Warming's *Flora of the Faroes* 108, 1908) contrasts the flora of the two groups of islands. He cites 375 species for the Zetlands, including those introduced by man, and 317 for the Faroes. 265 are common to both groups, 50 are peculiar to the Faroes, and 110 to Zetland. The Faroes have mountains of a much higher altitude than the Zetlands, hence the more distinctly alpine character of the flora. These alpines include:—*Ranunculus glacialis*, *Papaver radicatum*, possibly *Arabis alpina*, *Draba rupestris*, *Cerastium cerastoides*, *Sagina caespitosa* (*nivalis*), *Potentilla verna*. *Alchemilla faroensis*, *A. acutidens*, possibly *Dryas*, *Saxifraga decipiens*. *S. hypnoides*, *S. nivalis*, *S. rivularis*, *S. stellaris* (a curious absentee from Zetland), *Sedum villosum*. *Epilobium lactiflorum*, *E. alpinum*, *Gnaphalium supinum* (recorded from Ronas Voe but needs re-finding), twenty-one endemic Hieracia, several Taraxaca, *Veronica alpina*, *Bartsia alpina*, *Salix glauca*, *Juncus biglumis*, *Juncoides arcuatum*, *Carex atrata*, *C. Lyngbeyi*, *C. saxatilis*, *Poa glauca*, *P. alpina*, *Equisetum pratense*, *Polystichum Lonchitis*, and *Lycopodium annotinum*. The Faroes have, too, a small group of adventive species, mostly agrical, such as *Trifolium procumbens*. *Pisum sativum*, *Scabiosa arvensis*, *Apera Spica-venti*, *Briza media*, and *Lolium multiflorum*, the latter cultivated. Two or three northern coastal or lowland plants are in the Faroes but have not yet been found in the Zetlands, *i.e.*, *Carex salina*, *Juncus balticus* and *Koenigia islandica*.

In 1920 and 1921, in company with Prebendary Burdon, Mrs Wedgwood, and T. Churchill, I visited Zetland and noted all the plants observed, and collected specimens of the greater number. Several critical species still require working out. I noted 428 species, including introductions, and about 200 varieties, forms and hybrids. I may say that the species now known to grow in the Zetlands amount to 446 native species and 59 adventive species—505. 70 others have been recorded but they are mostly errors of identification. Such are:—*Ranunculus reptans*, *Fumaria Vaillantii*, *F. parviflora*, *Raphanus maritimus*, *Viola lutea*, *Dianthus deltoides*, *Silene Cucubalus*, *Cerastium semidecandrum*, *Stellaria graminea*, *Arenaria sedoides*, *Hypericum perforatum*, *Trifolium medium* *Potentilla procumbens*, *Rosa lutetiana*, *R. dumalis*, *Sedum anglicum*, *Myriophyllum spicatum*, *Callitriche verna*, *Conium*, *Anthriscus Scandix*, *Peucedanum sativum*, *Daucus Carota*, *Galium uliginosum*, *Gnaphalium sylvaticum*, *Anthemis Cotula*, *Artemisia Absinthium*, *Hieracium denticulatum*, *H. maculatum*, *H. flocculosum*, *H. lasiophyllum*, *H. truncatum*, *H. stictophyllum*, *Centaurium umbellatum*, *Myosotis collina*, *Veronica montana*, *Cuscuta epithymum*, *Nepeta Cataria*, *Plantago media*, *Polygonum Hydropiper*, *P. Raii*, *Populus nigra*, *Juncus inflexus*, *J. compressus*, *Sparganium ramosum*, *Potamogeton lanceolatus*, *P. lucens*, *P. vaginatus*, *P. crispus*, *Eleocharis acicularis*, *Eriophorum latifolium*, *Carex capillaris*, *C. caryophyllea*, *C. cespitosa*, *Calamagrostis epigeios*, *Avena fatua*, *Poa compressa*, *Bromus arvensis*, and *Dryopteris Thelypteris*. Among those which may be re-found are *Gnaphalium supinum*, *Taraxacum paludosum*, *Veronica Chamaedrys*, *Nepeta hederacea*, *Stachys sylvatica*, *Beta*, *Atriplex deltoidea*, *Polygonum Bistorta*, *Habenaria albida*, *Potamogeton gracilis*, *Rynchospora alba*, *Carex distans*, and *Juniperus communis*. Therefore, to the 506 species recorded we may safely add 4 = 510 species. In addition to these, further exploration may succeed in bringing up the number to 530.

Allusion has been made to the more alpine character of the Faroe flora. I was much surprised to find Zetland possessing so few alpines. Its flora most closely approximates to the Faroe flora, the Icelandic being still more arctic. Compared with the mainland of Scotland, it will be observed how many species fail to cross the sea. Its flora is also distinctly poorer than that of the Orkney group.

Notwithstanding the prolonged period the sun is above the horizon in the summer months, it must be remembered that the climate during that period is frequently cloudy, windy or wet, or, as I found, all three combined. In 1921 we only had what could be called two sunny days in a month, and the temperature was very low. In 1920 it was much the same, and our frequent experience was that, after motoring twenty miles or so to a suitable locality, scuds of rain came on and spoilt the day. Ronas Hill thus twice was put out of bounds, for it was shrouded in heavy mist and rain. Rarely, if ever, did we return in dry clothes. The islands are the haunt of winds, and these exert a powerful influence on the vegetation. On the hill-slopes the plants are very small, *Linum catharticum*, *Plantago maritima* and *Rhinanthus Crista-galli* being almost flowerless. *Vaccinium Myrtillus* is reduced to an inch or so, and is rarely seen flowering; *Draba incana* is dwarfed to less than an inch; *Erica cinerea* and *Calluna* are small and poor, and the Carices are depauperate, and in 1921 were almost barren and worthless for critical examination. The solitary specimen of *Melampyrum pratense* found was less than two inches high and possessed two flowers. Yet on the other hand many plants, although smaller in stature than their English representatives, had magnificent flowers. Noticeable among these were *Matricaria inodora*, *Lathyrus pratensis*, *Trifolium pratense*, *T. repens*, *Lotus corniculatus*, *Senecio aquaticus*, *Jasione* and *Raphanus Raphanistrum*. The plants which were in special beauty and luxuriance were the Eyebrights. They were so common, so profuse in flowering, and so showy and varied in the lovely tints of colour that it was worth the journey to see them. On the one sunny day we had at Sumburgh it was also a great delight to see the whitish stars of a sub-species of *Gentiana Amarella* studding the sandy soil, and to see the dense masses of deep indigo made by *Vicia Cracca* on the yellow sands. Some of the rocky cliffs were gay with *Sedum roseum* and Sea Thrift, and a few places such as Cliva Hill, Eala Burn, or Loch of Cliff, were gay with Hawkweeds.

The force of the wind in a storm is prodigious, and the surf or sea-spume is scattered for miles. It has been known to wash over the lighthouse near Hermaness, and evidence of it may be seen on the tops of the highest cliffs. It may be that some of the very local plants have been introduced in this way, for, as Warming says of the Faroes, the flora is a " young flora." It must be remembered that many of the plants are extremely local and exist only in small quantity. For instance, of *Hieracium breve*, perhaps only a score of specimens exist. West found only single specimens of *Juncus trifidus* and *Juncoides spicatum*. Less than a dozen specimens of *Arenaria rubella* have been noticed, and I found a solitary specimen which Lindman says is *Sagina saginoides*. This, too, is the case with water plants. Beeby found only a small quantity of floating *Elatine*. *Potamogeton suecicus* is extremely local in three lochs in which it grows, and I only saw *Tolypella nidifica* in a solitary loch in Dunrossness.

The absence of woods and hedges accounts in part for there being no sylvestral species, and the absence of wheat-culture limits the agrical introductions. There are no manufactories to bring in the accompanying aliens. There is, however, besides these causes some other influencing reason to account, for example, for the rarity of *Hypochoeris radicata* or the absence of so many species which might be expected to occur. This, as Warming says, may be due to juvenility, and contrasts strongly with such older floras as are possessed by the Azores, Canaries and Madeira, which are rich in endemic plants. To return for one moment to the extremely local character of a few species. Does not this support the theory of a somewhat recent introduction of species by natural means—wind, sea-currents, aquatic birds or man? I may instance the *Melampyrum* discovered by me this year, *Utricularia major* known only from one locality in Unst, *Bartsia verna* from one locality on the Mainland, *Aira caryophyllea*, *Senecio Jacobaea*, *Sium erectum* and *Radicula Nasturtium*, each extremely local. It must be remembered that the islands have been under sheep and pony-grazing from remote times, and that doubtless in more recent days the small bushes and trees, which we have good evidence to prove once grew on the islands, have been exterminated, so that except on some holm on a lonely loch, or some deep ravine on a wind-swept hill, there is but little chance for plants to thrive.

I may add that with the exception of the var. *alpinum* of *Polygonum viviparum* and the Lumbister supposed *Potamogeton gracilis* all Mr Beeby's critical plants have been regathered by me in my recent visits.

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(F.).—Signifies the plant grows in the Faroes.

!—Signifies that the writer has seen the plant in the locality.

*—New record for the Islands.

†—Adventive or introduced species.

× —Hybrid.

FLORA ZETLANDICA.

7. THALICTRUM ALPINUM L. (F.). Common, *E. L.* Dry pastures and stony places, especially on serpentine or limestone, descending even to sea-level. Tresta, Fetlar, *E. Fl.* Ronas Hill, 1460 ft. ! : Muckle Heog !, *Tate.* Balta Sound !, *C. C.* Local on schistose rocks at Ollaberry at less than 100 ft., *West.* Hill above Asta Loch ! ; Clousta Voe ; Lumbister, Yell ; Estwick Burn ; Bustwich, *Beeby.* Hoo Hill. Saxavord. Clibberswick. Watlee. Skaa. Cliva Hill. In loose stones on the border of Burga Water, a large-leafed form.

19. RANUNCULUS REPENS L. (F.). Frequent, *E. L. & Fl.* One of Tate's specimens from Bressay, teste H. C. Watson, is *R. acris.* Out Skerries, 1866, *Peach.* Not common, *West.* Collafirth ; Scalloway !, *Beeby Hb.* Bressay. Mousa. Not rare. Usually as a small form with more divided leaves. It is chiefly in soil disturbed by man.

20. R. ACRIS L. (F.). Everywhere, *E. L. & Fl.* Burrafirth, etc., *C. C.* Bressay, *Tate.* The type extends from north to south on sand tracts and to dry grassy hill-sides near the sea, *Beeby*, 1891. Bressay. Mousa.

Var. STEVENI (Andrz.). This is the var. *pumilus* of Ronas Voe, 1886. Common, Ollaberry ; Skelberry ; Bressay ; pastures by Asta and Tingwall lochs, 1907, *Beeby.*

Var. BORAEANUS R. & F., f. RECTUS (Bor.). Quendal Sands ; Scalloway ; Hillswick ; Ollaberry ; Balta Sound ; Ronas Voe ; Hamna Voe, local, *Beeby.* Beeby, in 1907, doubts if type *Boraeanus* occurs.

Sub-var. PUMILUS R. & F. Loch of Lumbister, Yell, teste Rouy, *Beeby.*

Var. FRIESIANUS R. & F., forma VULGATUS (Jord.). Near Spiggie ! ; between Lerwick and Grimista ; Estwick Burn ; Ollaberry ; Gluss Burn, teste Rouy, *Beeby*, 1907. Ronas Hill ; Unst, *C. C.*

Var. TOMOPHYLLUS (Jord.). Balta Isle, *W. R. Linton.*

The specimens I saw at Balta Sound in 1920 I should refer to var. RECTUS Bor. They were in magnificent flower in 1921.

24. R. FLAMMULA L. (F.). Common, *E. L. & Fl.* Lerwick; Ronas Hill; Unst, *C. C.* Bressay. Mousa. Balta Isle.

Var. TENUIFOLIUS Wallr. Edmondston's *reptans* and *radicans* (Nolte). Little Setter Loch, Yell, *Beeby* in *Scot. Nat.* 21, 1887. In cultivation this at once reverted to type. See *l.c.*, 210, 1888. Scalloway; Punds Loch; Eala Water!; Burga Water!; Roer Water; Twart Burn, *Beeby.* Bardister. Burrafirth. None of the specimens seen in 1920 and 1921 could be referred to *R. scoticus* Marshall, itself only a variety of *Flammula.*

[25. *R. reptans* L. Stony margins of sub-alpine lakes, *E. Fl.* This is an error for the creeping state of *R. Flammula.* The true *reptans* is recorded for the Faroes.]

*38. R. TRICHOPHYLLUS Chaix. [Kirkiegarth Loch, *Beeby*, 1891. He transferred it to *R. Drouetii* F. Schultz in *Ann. Scot. Nat. Hist* 166, 1907.] Ditch near Loch Spiggie, 1921.

39. R. DROUETII F. Schultz. Kirkiegarth Loch, *Beeby*, 1891. See above. The specimen is in poor condition and is not characteristic.

42. R. BAUDOTII Godr. Abundant at the north end of Spiggie Loch! and in Brue and Hillwell Lochs, *Beeby, l.c.*, 27, 1891.

46. R. HEDERACEUS L. Skelberry, etc., not seen north of Levenwick, *Beeby, l.c.*, 27, 1891. Fair Isle, *Beeby Hb.* Spiggie, 1921, beautiful and characteristic.

47. R. FICARIA L. (F.). Abundant, *E. L. & Fl.* Ollaberry; Sundabanks, *Beeby Hb.* Dunrossness, *Mrs Saxby, Jun.* Garden weed at Balta, *Mrs Saxby.*

[*R. glacialis* L. and *R. auricomus* L. (F.).]

48. CALTHA PALUSTRIS L. (F.). Common, *E. L. & Fl.* Unst; Yell, *C. C.* Baliasta, Unst; Little Setter, Yell; Ollaberry; Scarff Burn; Hamna Voe, *Beeby.* Bressay. Mousa. Lund, etc.

"By the Loch of Cliff the large erect *C. palustris* which did not root at the nodes had leaves exactly like those of *C. radicans*," *Beeby* in *Scot. Nat.* 210, 1887.

49. C. RADICANS Forst. Near the Loch of Spiggie, 1921.

Var. ZETLANDICA (Beeby in Scot. Nat. 21, 1887, under *palustris*) Druce. South end of Loch of Cliff!; Arisdale Burn; Hamna Voe; Little Setter Loch, Yell; Clickhimmin Loch!, *Beeby*. Haroldswick. Uyea, etc.

Mr Beeby thought it was nearer to *palustris*, of which it has the leaf-shape although a smaller plant. But the chief character is the rooting node which is maintained in cultivation. I therefore put it under *radicans* in my *List*.

50. TROLLIUS EUROPAEUS L. Near Quendal. *E. Fl.* Loch End. *Beeby*, 1889.

77. CASTALIA ALBA Woods. In a little loch N.-W. of Ronas Hill, *E. Fl.* Lunga Water; Bunya Water; Loch at Brunatwatt, 1891; tarn by Lunga Water, *Beeby*.

Var. *OCCIDENTALIS (Ostenf.). Near Lunga Water, 1920. Probably the Shetland lilies belong to the variety, which may be the var. *minor* (DC.).

†80. PAPAVER RHOEAS L. Alien. Skaa, Unst; North Maven, *E. Fl.*

†81. P. DUBIUM L. Abundant. *E. L. & Fl.* Unst. *C. C.* Norwick!, *Tate*, 1865. Exnaboe, 1891, as *Lamottei*; Balta, *Beeby*.

Some of the Norwick plants are extremely small. Doubtless at one time English oats or corn were sown here as evidenced by the occurrence of the Poppy, *Valerianella olitoria*, *Geranium molle*, *Gnaphalium uliginosum*, etc.

[*P. radicatum* Rottb. (F.).]

89. GLAUCIUM FLAVUM Cr. Salam [Sullum] Voe; North Maven. *E. Fl.*

†111. FUMARIA OFFICINALIS L. Frequent. *E. Fl.* Quendal Bay; Sconsburgh; Scalloway!; Fetlar. *Hb. Beeby*. Setter. Conningsburgh.

[113. *F. Vaillantii* Lois. Balta Sound, 1839. *E. Fl.* In

Edmondston's *List F. parviflora* is given as abundant in sandy fields. Both are doubtless errors.]

122. RADICULA NASTURTIUM Druce. Sand Lodge, Mr Bruce's, *C. C.*, 1868. It still grows plentifully in a ditch to the north of the house, to which it may have been originally introduced.

140. ARABIS PETRAEA Lam. (F.). Rare, *E. L.* Frequent on exposed serpentine, *West.* Springfield !, *Beeby.*

Var. GLABRA Edmondst. On loose serpentine gravel, Balta Sound, *E. Fl.* All the Unst plants are glabrous. It descends on the serpentine to 50 feet and varies from white to lilac-flowered. At Clibberswick it grew on sea cliffs as well as on the hill. The older trivial is var. *faroensis* (Horn.) = *Cardamine faroensis* Horn.

[*A. alpina* L. Recorded by Trevelyan from the Faroes, but needs confirmation.]

142. CARDAMINE PRATENSIS L. (F.). Common, *E. L. & Fl.* Unst; Yell, etc., *C. C.* Tangwick !; North Maven !; Sundabanks !; west of Hagdale !, *Beeby.* Uyea. Brecken, Unst. Swinister, North Maven. Mousa. Bressay. Spiggie, etc.

Var. DENTATA (Schultes). Balta Sound; Haroldswick; Ronas Voe, *Beeby.*

I should not refer any Shetland plant seen by me to Schultes' *dentata.*

146. C. HIRSUTA L. (F.). Belmont, Unst, *E. Fl.* Rocks by the Vaara Burn; by Burga Water !; above Hamari Water, *Beeby*, 1908.

[*C. sylvatica* Link. (F.).]

161. DRABA INCANA L. (F.). On serpentine, Unst ! and Fetlar; on limestone near Tingwall !; on granite near North Roe, *E. Fl.* Balta Sound !, *C. C.* Hoo Field !, *Beeby.* Muckle Heog !, Unst, 400-500 ft., *Tate* (var. *confusa* = the type).

Var. CONTORTA (Ehrh.). Springfield and Muckle Heog, 50-450 ft., *Tate.* Loch of Cliff; Tingwall, *Beeby.* A plant from Wick of Hagdale Beeby thought came under var. *flexuosa* Lange, but was too immature to be decisive. I have only seen the type with glabrous pods in Shetland as at Tingwall. It is plentiful on Clibberswick nearly to sea level, above Watlee Loch, on Colvadale Hill, etc. It is sometimes dwarfed to 1½ inches, and occasionally it is a tufted plant.

[*D. hirta* L., var. *rupestris*. (F.).]

167. COCHLEARIA OFFICINALIS L. (F.). Frequent. *E. L. & Fl.* Ulsta, the most northerly British land, *E. Fl.* Mousa; Lerwick; Unst, *C. C.* Spiggie only, *Beeby*, 1891. Fair Isle, *Straker*. Holm; Scalloway, *Beeby*. Westing. Balta Isle. Hermaness.

168. C. ALPINA Sweet. Very dwarfed plants. Balta, *West*. [These are probably *micacea*.]. Frequent (*sic*), *Saxby Fl.* Sandwick; Hillswick, true in cultivation, *Beeby*, 1897. Tate thought this was the *C. groenlandica* of the *Flora*.

169. C. MICACEA Marshall. This is probably the plant recorded by Beeby in 1886 as *groenlandica* from Balta serpentine hills (!) and hills near Ollaberry. Balta Sound, *W. A. Shoolbred*, 1892 (*Journ. Bot.* 152, 1895). Hill of Hamar, *Beeby*. Greenfield. Watlee. Clibberswick.

170. C. GROENLANDICA L. (not of *Fl. Shetl.*). Ollaberry, *Beeby* in *Scot. Nat.* 22, 1887, teste Lange. This proved constant in cultivation. See *Ann. Scot. Nat. Hist.* 33, 1889. Also from the Heogs, Unst, *Hanbury*; Fair Isle, *Straker*; Laxfirth Voe, Lerwick; Sandvoe, *Beeby*. Ordale, Unst.

172. C. DANICA L. Muddy sea shores, Dales Voe; Balta Sound, *E. Fl.* Large plants at the Knabb, Lerwick; Bressay, *Beeby*.

[" All the many different forms of *Cochlearia* found in the Faroes pass so imperceptibly into one another that it seems most natural to name them collectively under one name. *C. danica* does not occur."—Warming.]

*†176. HESPERIS MATRONALIS L. Alien. On the foreshore, Balta Sound, Unst, 1921.

†177. WILCKIA MARITIMA Scop. Alien. Knabb, Lerwick, *Beeby*, 1892. It is commonly cultivated there and is a mere garden stray.

204. SUBULARIA AQUATICA L. (F.). Bardister Loch, *Beeby*, 1891. Proves to be common in the lochs, *Beeby*, *l.c.*, 1907. Tarn on Gibbies Law Burn, *Beeby Hb.* Still at Bardister Loch, 1920.

*†205. BRASSICA OLERACEA L. Alien. Merely an escape from cultivation. In Shetland cabbage seed is sown in small plots surrounded by a high wall of rough stones in order to give shelter to the seedlings, which are grown very closely packed. They are then transplanted. Some of these seedlings had been washed down by a brook near Hoo Field in 1921, but it is scarcely probable that they will establish themselves.

†216. B. ARVENSIS Scheele. (F.). Far too common, *E. L. & Fl.* Unst, *C. C.* Balta, *Beeby*. Scalloway. Lerwick. Norwick, etc.

[*B. campestris*, *B. Napus*, and *B. nigra* are recorded from the Faroes.]

†217. B. ALBA Boiss. (F.). Alien. A garden weed. Walls, and in cultivated fields, 1891, *Beeby*.

232. BURSA PASTORIS Weber. (F.). Very common, *E. L. & Fl.* Lerwick ; Unst, *C. C.* Scalloway, *Beeby Hb.* Haroldswick, 1865, *Tate*.

*B. BRITTONII (Almq.). Balta. Haroldswick.

†241. LEPIDIUM SATIVUM L. Alien. Knabb, Lerwick !, *Beeby*, 1892. Also seen there in 1920.

†249. THALSPI ARVENSE L. Alien. Sinclair's garden, Ollaberry, *Beeby*, 1896.

271. CAKILE MARITIMA Scop. (F.). Abundant, *E. L. & Fl.* Exceedingly large, Burrafirth !, *C. C.* Breiwick, North Maven, *Beeby*. Norwick. Haroldswick, luxuriant and very fragrant, slightly suggesting vanilla. Uyea. Spiggie. Lerwick. Quarff, etc.

Var. INTEGRIFOLIA Hornem. Mid Yell Voe, 1887 ; Knabb, Lerwick, 1888 ; Sandwick, *Beeby Hb.*, but the leaves are lobed. I could see no entire leaved plants in the Shetlands. In the Quarff plant they were the least cut. Probably the Haroldswick plant may be the var. *latifolia* (Poir.) which is recorded from the Faroes.

274. RAPHANUS RAPHANISTRUM L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Lerwick, as *Sinapis arvensis*, *Tate.* Fair Isle, *Skene.* Balta; Sand Voe; Sullum Voe, *Beeby Hb.*

Var. *FLAVUM (Gray) Druce. Bressay, Dunrossness. It is the prevailing form. The petals are much larger than those of the English plant.

[275. *R. maritimus* Sm. East shores of Bressay, *E. Fl.* Doubtless an error.].

293. VIOLA SYLVESTRIS Kit. (F.). Ollaberry; rocks above Eala Water, *Beeby*, 1887; Lerwick, etc., 1889; Laxfirth Voe, *Beeby Hb.* Mavisgrind.

294. V. RIVINIANA Reichb., as *V. canina.* (F.). Common, *E. L. & Fl.* Buness, *Tate.* Shetland, *Middleton* in *Scot. Nat.* 319, 1886. Balta Sound, 1888; Ollaberry; Melby; Sandness; Eala Water; Burn of Skaa!, *Beeby Hb.* Den of Sundabanks. Scalloway. Bressay. Mousa. Loch of Fleet. Watlee. Norwick, etc.

Var. *DIVERSA Greg., forma PSEUDOMIRABILIS Greg. Loch of Cliff.

*295. V. RUPESTRIS Schmidt, var. GLABRESCENS Neum. Balta Sound, 1920; Dunrossness, teste Gregory.

296. V. CANINA L. (F.). Buness, Unst!, *Tate*, 1866, as *Riviniana.* Shetland, *Middleton* in *Scot. Nat.* 319, 1886. Here and there, *Beeby*, 1887. Unst and Ollaberry, *West.* Top of Ronas Hill; Ollaberry; Saxavord!, *Beeby Hb.* Tingwall. Cruciefield. Voesgarth. Unst. Scalloway.

Var. ERICETORUM (Schrad.). Burrafirth. Bressay.

Var. *LANCEOLATA M.-Don. Skaa. This, Mrs Gregory thought, might be *canina* × *lactea*, but the latter species is not known north of Yorkshire.

Var. *CALCAREA Reichb. Balta, serpentine.

301. V. PALUSTRIS L. (F.). Bressay!; Unst; Yell, *Tate*, 1866.

Ronas Hill, *C. C.* The Shetland plant is remarkable for its often apiculate not very broad leaves, teste Murbeck. Hillswick; Collafirth; Valla Dale; Yell, *Beeby Hb.* Watlee. Hoo Hill.

[303. V. TRICOLOR L. (F.). Very common, *E. L. & Fl.* Balta Sound; Saxavord, *C. C.* Edmondston realised that *V. arvensis*, " frequent in cornfields, was among the most distinct of our British Violets." See below.].

*V. LLOYDII Jord. Tingwall. Laxfirth. Whiteness. Bressay. Norwick. Balta. Burrafirth, etc. Doubtless the *tricolor* of previous writers.

*V. SEGETALIS Jord. Balta. Norwick. Lerwick. This is doubtless Edmondston's *arvensis.*

[307. *V. lutea* Huds. Error. Shetland, Beeby sp., Bennett in *Scot. Nat.* 58, 1886. It is omitted by Trail. It is an error of identification. The plant belongs to the tricolor section. See *Ann. Scot. Nat. Hist.* 165, 1907. Not common (*sic*), *Saxby Fl.*].

308. POLYGALA SERPYLLACEA Weihe. (F.). The more common form, *Tate*, 1865, in *Hb. Druce*, as *depressa.* The only form seen, *Beeby*, 1886. Not frequent, *West.* Otterswick, Yell; Tingwall!, *Beeby Hb.* Sundabanks. Hoo Field. Bressay. Mousa. Saxavord. Hermaness. Vallafield.

309. P. VULGARIS L., aggregate. Common, *E. L. & Fl.* As the segregate, Balta; Ronas Hill, *C. C.* Fine and typical, Gluss Burn, Ollaberry, *Beeby*, 1892. Near Spiggie. Brousta. Scalloway. Eala Water. Mousa. Burrafirth. Haroldswick. Clibberswick. Whiteness. North Roe. Mavisgrind. Some of these had narrow sepals.

Var. *BALLII Ostenf. (F.). Mousa Isle. Brousta.

[318. *Dianthus deltoides* L. Isle of Vaila, *Dr Neill.* See *E. Fl.*, xiii. Doubtful, *Beeby.* Probably the Sea Pink, a local name for *Statice*, was meant.].

334. SILENE MARITIMA Sm. Common, *E. L. & Fl.* Mousa!; Unst; Yell, *C. C.* Balta!; Hamar; Burrafirth!; Unst; Hamna Voe,

Beeby. Fair Isle, *Skene*. Lerwick!, *Tate*. Sumburgh. Westing. Watlee. Hermaness.

[336. *S. Cucubalus* Wib. Saxby in the *Flora* says that this occurs on the grassy cliffs on the northern side of Hermaness, but doubtless he mistook the large form of *maritima* which alone grows there.].

346. S. ACAULIS L. (F.). Very plentiful on the euphotide and serpentine, *E. L. & Fl.* Muckle Heog, *Tate*. Hunie!; Unst, *C. C.* Common at not more than 100 feet, *West*. Whiteness Voe; Springfield; Wester Wick; Muckle Heog!; Unst, *Beeby Hb.* Abundant on the Lee of Setter and on Hoo Field to 100 feet. Balta Isle. Hermaness. Saxavord. Clibberswick, etc. Descends to the coast level near Haroldswick and is common on the road-side (50-80 ft). Balta, seeding freely. Ascends to 850 ft.

358. LYCHNIS FLOS-CUCULI L. (F.). Very common, *E. L. & Fl.* Unst, *C. C.* Ollaberry, *West*. Tingwall!; Hamar Voe; Clousta Voe; Mailand Burn!, *Beeby Hb.*

Var. *CONGESTA Lec. & Lam. Lund. Balta.

Sub-var. *RUBESCENS Druce, with the calyx ribs reddish. Ronas Voe. Bressay. Mousa. Dunrossness.

Forma *ALBIFLORA (Peterm.). Coults Mill, Uyea. Haroldswick.

?†359. L. ALBA Mill. Rare, *E. L.* Very little either at Ollaberry or Unst, *West*. Not seen by Beeby. Garden at Balta Sound, *Saxby Fl.* I saw white-flowered *dioica* there. Alien or error.

360. L. DIOICA L. (F.). Common, *E. L. & Fl.* Haligarth, *C. C.* Burrafirth; Loch End; Burravoe; Scousburgh; Mid Yell Voe. *Beeby Hb.* Bressay.

Var. ZETLANDICA (Compt.). Burrafirth, *Tate*, 1865 (not as given in *Camb. Fl.*, Binnafirth). Mid Yell Voe. *Beeby*. Scalloway. *Straker*. Noup of Noss, *Smith*. Tetlar (*sic*), *Compt.* (? Fetlar). Hagdale, 1920. Setter. Fedaland. Dunrossness. Spiggie. Whiteness. Varying from light pink [forma *expallens* (Lange)] to dark crimson. Often grown in gardens. It is quite a beautiful plant. Also in Hoy, Orkney.

†363. L. GITHAGO Scop. (F.). Casual. An import with rye or wheat seed, *Saxby Fl.*

369. CERASTIUM NIGRESCENS Edmondston Fl. xv., 1845, et ex Watson Cyb. Brit. i., 233, 1847. See also *Scot. Nat.* 24, 1887. (F.). Briefly the history of this interesting species is as follows:—Edmondston, then a youth, first discovered it on the serpentine of Balta Sound and described it in the *Phytologist* ii., 95, 1845, as *C. latifolium*. Subsequently he saw it differed from the continental plant, and in the preface to the *Flora of Shetland* called it *C. nigrescens* (the preface was evidently written later than the text, as it gives certain additions). He distributed specimens to the Botanical Society of London as *C. nigrescens* Edm. MS., and these are commented on in the *Proceedings* of February 7, 1845, which are printed in the *Phytologist* 96, 1845, making it a valid publication. These are the proofs of its publication on or before 1845, and his name has precedence over *C. arcticum* Lange (itself a compound species) or *C. Edmondstonii*. The plant is frequent over the serpentine of the hills to the north of Balta Sound, making a conspicuous feature of the vegetation, and it was found also on broken limestone above Loch Watlee by F. J. Hanbury in 1894. I was unable to find it on Clibberswick or Colvadale. The nigrescent character of the leaves seems to be due to the presence of chromate of iron in the soil. In ordinary soil the leaves lose the purple coloration although the seed and other characters remain constant. It is unknown elsewhere, but the wholly green plant, forma (or var.) *Smithianum* nov. comb. (*C. latifolium* Sm., non L.), extends as far south as Snowdon, but always as an alpine species not descending below 2000 feet.

Var. ACUTIFOLIUM (Edmondston) under *latifolium*. This is a slight variation and, as Beeby says, grows rather more inland. I was unable to notice any hybrid although the Snowdon plant hybridises with *vulgatum*.

370. C. VULGATUM L. (F.). Very common, *E. L. & Fl.* Lerwick; Unst, *C. C.* Skaa, Unst, *Tate.* Balta Sound; Asta Voe; Ollaberry; Lerwick; Hildasay, *Beeby Hb.*

Var. MACROCARPUM (Schur) Druce=var. LONGIROSTRE (Wich.).

Grassy places among rocks at Ollaberry, with leaves 1½ in. long and capsule ¾ in. long, *Beeby* in *Scot. Nat.* 23, 1887.

Var. ALPINUM Gren. (F.). Tingwall. Asta. Scalloway. Hoo Field. Mousa. Clibberswick. A handsome plant. Under this as forma SERPENTINI (Syme) Druce. Burrafirth; Ollaberry (*Scot. Nat.* 34, 1889), *Beeby*. Balta, on the serpentine. Watlee.

Var. HOLOSTEOIDES (Fr.). Hill of Hamar. Unst. and Fair Isle, *Beeby*. They lack the characters of the tidal plant, and come under var. LUCENS Druce, which is not unfrequent on the serpentine at Balta, Clibberswick, Watlee, Colvadale, and Scalloway. The same form occurs on the serpentine at Cabrach, but it may be only a soil variant. To this cause I should also ascribe forma *nigrescens* mihi, alluded to by West as a rigid and nigrescent form, from the serpentine, where it is common, but I have also seen it in sterile fields in the Midlands and on dry banks by the coast in Britain.

371. C. VISCOSUM L. (F.). Common, *E. L. & Fl.* Unst; Scalloway, *C. C.* Ollaberry, *Beeby Hb.* Tingwall. Bressay. Mousa. Haroldswick. Muness, etc. Much less common and at lower levels than *vulgatum*. Often as a neat, erect plant; and usually in disturbed ground.

[373. *C. semidecandrum* L. Error. "Common, but hardly distinct from *triviale* (*sic*)." *E. Fl.* Unst, *C. C.* Doubtless a form of *C. vulgatum* or *tetrandrum* was mistaken for it. The small form, *congestum*, of the latter species has a superficial resemblance. Beeby and myself searched for it in vain. Needs confirmation. Not in the Faroes.]

374. C. TETRANDRUM Curt. (F.). Sandy ground, particularly frequent in the Island of Balta!, *E. L. & Fl.* Gluss Voe, 1865, *Tate*. *C. atrovirens* Bab. is said also to be common. It is wrongly stated to be a variety of *triviale*. Hunie, Unst, *C. C.* Common about the coast. *Beeby*. Very dwarfed on the serpentine. *West*. Ollaberry!; Burrafirth!; Hildasay; Mid Yell Voe; Brough of Culswick, Walls, *Beeby*. Very variable. Balta. Lund. Scalloway. Burrafirth. Hermaness. Saxavord. Skaa. Clibberswick. Lerwick. Bressay. Cunningsburgh. Sumburgh. Spiggie, etc.

Var. ZETLANDICUM Murbeck. (F.). Ness, N. Yell! (*Tate* as *pumilum*). Balta Isle. Skaa Cliffs. Saxavord. Clibberswick. Hill of Hamar.

Forma CONGESTUM Druce. Scalloway. Balta.

Forma LUXURIANS Druce. Spiggie. Lund.

*374 (2). C. SUBTETRANDRUM Murb. Lund, Unst, 1921. This is somewhat doubtful.

[*C. cerastoides* Vill. (F.).]

379. STELLARIA MEDIA Vill. (F.). Everywhere common, *E. L. & Fl.* Lerwick; Yell; Unst, *C. C.* Clousta; North Roe; Balta, *Beeby Hb.* Bressay. Mousa, etc., frequent.

Var. MAJOR Koch. A fleshy maritime form on the shingly beech, Gutcher, Yell, *Beeby* in *Scot. Nat.* 211, 1887. Beeby also has a var. *neglecta* from the same place. This may refer to the same plant. Neither are the *S. umbrosa* Opiz. The plant is very variable in size, but it is extremely responsive to soil conditions. An extreme form is the f. *nana* Lange. Cruciefield Hill, Unst, *Beeby*, 1886. It also occurs on Clibberswick, etc.

[383. *S. graminea* L. Abundant, *E. Fl.* Error. Sought in vain, *Beeby*.]

384. S. ULIGINOSA Murr. (F.). Common, *E. Fl.* Burrafirth, *C. C.* Bressay, *Tate.* Everywhere in wet places, *Beeby.* Sand Voe; North Maven; Tingwall!; Collafirth, *Beeby Hb.* Bressay. Haroldswick, etc.

389. ARENARIA NORVEGICA Gunn. Found by Edmondston in May 1837. See *List.* On serpentine gravel to the north and north-east of Balta Sound, *E. Fl.* A single plant on Muckle Heog, 430 ft.; Balta, 50-80 ft., *Tate.* About Loch Watlee!, *Beeby & Hanbury.* West of Cruciefield!, *Beeby.* Clibberswick, in some plenty, *Burdon & Druce.*

391. A. SERPYLLIFOLIA L. Quendal House; Exnaboe; Dunrossness, *Beeby.* Sumburgh, on the sand dunes, looking native.

393. A. PEPLOIDES L. (F.). Common, *E. L. & Fl.* Burra-

firth, *Tate*, 1865. Loch End, *C. C.* Quarff. Sumburgh. Fedaland. Lerwick, etc. Lund. Haroldswick. Balta. Bressay. Mousa.

Var. DIFFUSA Hornem. Mid Yell Voe, but "leaves shorter and broader than in the Greenland plant," Lange, *Beeby*, *l.c.*, 24, 1887. Spiggie, etc. This is possibly the var. *major* Rostr. of the Faroes. Omitted in the *Camb. Fl.*

396. A. VERNA L. Gravelly ground, Ronas Hill, *Tate*. Whiteness Voe, *Beeby*.

397. A. RUBELLA Smith. Stony places on serpentine, Wick of Hagdale, very sparingly, *Beeby*. Lange thought it to be *A. hirta*, f. *condensata*. (See *Scot. Nat.* 24, 1887.). A few specimens on the serpentine slope immediately north of Balta Sound, and also near the Loch of Watlee. *Saxby Fl.* Sought in vain, 1920-21. *A. verna*, var. *hirta*, is reported from the Faroes. The Zetland plant is very near to the Breadalbane plant. The altitude in Zetland is under 400 feet, not 880 metres, the lowest elevation cited in the *Camb. Fl.* for the species.

[398. *A. sedoides* Kittel. Error? Hill of Clibberswick, *E. L.* Hill of Haroldswick, Unst; Ronas Hill, *E. Fl.* Colvadale, *Saxby Fl.* Never confirmed. Probably barren *Silene acaulis* was mistaken for it.]

399. SAGINA NODOSA Fenzl. Tingwall!, *Tate*, 1865, in *Hb. Druce*. Balta, *C. C.* Sparingly there on the hills, *Beeby*. Rare, Ollaberry, *West*. Watlee. Colvadale. Clibberswick.

Var. *MONILIFERA Lange. Tingwall. Balta. Clibberswick. Colvadale.

401. S. SUBULATA Presl. (F.). Unst; Fetlar; Bressay, *E. Fl.* Frequent, Galta Water; Houllma Water!; Culswick; Eala Water!; Ronas Hill, 1000 ft., *Beeby*. Balta Sound. Colvadale. Clibberswick.

Var. GLABRATA Lange. Ollaberry, *Beeby* in *Scot. Nat.* 25, 1887. Ronas. Saxavord. Burga Water, as a lax plant. Lea of Setter. Colvadale. Watlee.

403. S. SAGINOIDES Dalla Torre. [Frequent, *E. Fl.* Error. Occasionally on the serpentine at Balta Sound; stony places near Eala Water, *Beeby*, but subsequently found to be only forms of *subulata*. See *Ann. Scot. Nat. Hist.* 104, 1909.]. A solitary specimen, gathered by me in 1920 on Muckle Heog, Unst, is passed as this by Prof. Lindman. I could not see it in 1921.

[*S. nivalis* Fr. = *S. caespitosa* Lange. (F.).]

407. S. MARITIMA Don. Isle of Balta!; Sullum Voe; Brae, near Delting, *E. Fl.* Cliffs about Springfield, Unst!; Scalloway!, *Beeby*, 1888. East side of Unst, *C. C.* Surima Ness; Asta Voe!; Hildasay, *Beeby Hb.* Knabb, Lerwick. Balta. Hagdale. Uyea Sound. Bressay. Sumburgh. At 300 feet on the Hill of Hamar, Unst. Both prostrate and erect plants.

*Var. DEBILIS Jord. Lerwick. Balta Isle.

Var. PROSTRATA Towns. Mousa. Bressay.

408. S. PROCUMBENS L. (F.). Very common, *E. L. & Fl.* Unst; Yell, *C. C.* Lerwick, *Tate.* Ollaberry, *West.* Fair Isle, *Straker.* Sandwick; Loch of Uyea; Asta Voe; Sundabanks; Swinna Voe, Ainst, *Beeby Hb.* Bressay. Mousa. Balta Isle.

Var. PENTAMERA Druce. (F.). This is doubtless the *S. saginoides* of Edmondston, which, as Beeby says, is almost as common as the type, as at Scalloway, Lerwick, etc.

× SUBULATA Presl = × S. MICRANTHA Boreau. Stony places about Eala Water. Beeby at first thought it was *saxatilis*, and afterwards this hybrid. I should not separate it from *procumbens*, but I have the true hybrid* from near Lunga Water.

410. SPERGULA SATIVA Boenn. (as *arvensis*). (F.). Too common, *E. L. & Fl.* Lerwick, 1865, *Tate.* Unst, *C. C.* The only form seen. Top of Sneug, Foula; Clousta; Burrafirth, *Beeby.* Haroldswick. Norwick. Bressay.

412. SPERGULARIA MEDIA Presl (as *S. marginata*). (F.). Balta Voe, north side, *Beeby* in *Scot. Nat.* 211, 1888, as a robust plant, seeds nearly apterous. Laxfirth Voe; Clousta; Queyfirth, *Beeby Hb.*

Var. *ROBUSTA Druce. Balta Sound, near Ordale, 1920.

413. S. SALINA Presl (as *S. marina*), *E. L. & Fl.*, described as not unfrequent. Scalloway!; Uyea!; Asta Voe!, *Beeby*. Bressay.

421. MONTIA FONTANA L. (F.). The var. *rivularis*, Tate (1885) says, is common throughout the islands. The Shetland plant is *M. lamprosperma* Cham., which is the Linnean *M. fontana*. Ronas Voe; Mill Loch of Uyea, North Maven; Fair Isle, *Beeby*. Bressay. Mousa. Watlee. Saxavord. Lund, etc.

Var. *BOREO-RIVULARIS Druce. Haroldswick. Saxavord. Loch of Cliff. Sundabanks. Bressay. Fedaland. Eala Water.

424. ELATINE HEXANDRA DC. Floating specimens in Kirkiegarth Loch, *Beeby* in *Ann. Scot. Nat. Hist.* 167, 1907. In 1920 I failed to find it in either Bardister or Kirkiegarth Lochs.

432. HYPERICUM PULCHRUM L. Common, *E. L. & Fl.* Ronas Hill!; Unst!, *C. C.* Clousta; Fetlar; Fair Isle; Burn of Sundabanks!; Dales Voe!, *Beeby Hb.* Cunningsburgh. Scalloway. Hoo Hill. Burrafirth.

Var. PROCUMBENS Rostr. (F.). Abundant on the serpentine hills of Balta!; south side of Ronas Voe!, *Beeby, l.c.*, 25, 1887. Burrafirth, *Tate*, 1865. Cunningsburgh. Colvadale. Gallow Hill. Hermaness. Lee of Setter. Clibberswick. This keeps constant in culture.

With cream-coloured flowers on the hills above Lochs of Hostigates, *Beeby*.

[*H. quadrangulum* L. (F.).]

[436. *H. perforatum* L. Error? Near Ollaberry and Moss Bank, *E. Fl.* Needs confirmation.]

437. H. HUMIFUSUM L. Unst, one locality, *West*.

466. RADIOLA LINOIDES Roth. Moor at Skelberry and Brue Loch, *Beeby*, 1891. Scalloway, one locality, *West*. S.-E. of Spiggie, *Beeby Hb.*

†469. Linum usitatissimum L. Alien. Rare, *E. Fl.* Balta foreshore.

470. L. catharticum L. (F.). Common, *E. L. & Fl.* Unst; Scalloway, *C. C.* Muckle Heog, 1865, *Tate.* Very dwarfed and sometimes one-flowered on the serpentine, *West.* Quendal Bay; Voesgarth Hill; Balta Sound; Scatt, *Beeby Hb.* Laxfirth. Whiteness. Setter. Bressay. Mousa. Muness.

Var. *dunense Druce. The common plant on the serpentine. Spiggie. Hoo Field. Sumburgh, etc. Often infected with *Melampsora Lini.*

†478. Geranium pratense L. Alien. Unst, *West.* Balta Sound, *E. Weeks.* Merely a garden escape, as at Haroldswick foreshore and near Walls.

[*G. sylvaticum* L. (F.).]

†479. G. phaeum L. Alien. Tresta, Fetlar, *E. L. & Fl.* 34.

*†483. G. dissectum L. Casual. Garden weed at Balta, 1921.

484. G. molle L. Common, *E. L. & Fl.* and *Saxby Fl.* Seen by *Tate.* Burrafirth; Scalloway!, *Beeby Hb.* Norwick, Unst!, *Mrs Saxby*, in small quantity. Alien, doubtless, as in the Faroes.

488. G. Robertianum L. On the shore at Boddam, Dunrossness, *Beeby*, 1891.

497. Erodium cicutarium Ait. Sandwick Parish. Low's *Tour*, 1774. Sandy ground, Levenwick, *Beeby*, 1907.

504. Oxalis Acetosella L. (F.). At 500 ft. on the Björgs of Skelberry, *Beeby*, 1907. Perhaps the same locality as Pettadale Water, with *Hymenophyllum*, *Beeby Hb.*

†524. Acer Pseudo-Platanus L. Alien. Planted only.

†537. Ulex europaeus L. Alien. Hill of Wormiedale, *E. L.* Planted at Tingwall, *Tate*, and at Balta Sound and Dales Voe, *Beeby.*

†540. CYTISUS SCOPARIUS Link. Alien. Planted at Balta Sound, *Beeby*.

[598. *Trifolium medium* Huds. Error. Frequent, *E. L. & Fl.* and *Saxby Fl.* "Probably a narrow-leafed form of *T. pratense*," *Beeby*. Doubtless the luxuriant form of *pratense* was mistaken for it.]

599. T. PRATENSE L. (F.). Abundant, *E. L. & Fl.* Bressay, 1865, *Tate*. Pale-flowered form. Bardister; Hillswick, *Beeby*. Hoo Field.

Forma ALBA. Bressay.

*†627. T. HYBRIDUM L. (F.). Alien. Balta.

628. T. REPENS L. (F.). Everywhere, *E. L. & Fl.* Bressay, 1865, *Tate*. Unst, *C. C.* Burrafirth, and a dwarf, large-flowered form near the sea at Hillswick Voe, *Beeby*. Spiggie. Scalloway. Sumbrugh. The flowers are larger than those of the English plant.

[*T. procumbens* L. (F.).]

641. ANTHYLLIS VULNERARIA L. Abundant near the sea. *E. L. & Fl.* Unst, *C. C.* Springfield, *Beeby*. Spiggie. Scalloway. Brousta. Setter. Mousa. Skaa. Westing.

Var. MARITIMA Koch. Burrafirth Cliffs, a beautiful plant. *Beeby*, 1887. Altered in *Scot. Nat.* 212, 1888, to var. *ovata* Bab. *in litt.* Lange had meanwhile provisionally named it var. *macrophylla*. In cultivation, however, the large terminal leaflet became less pronounced, and the new name was dropped.

Var. BICOLOR R. & F., as *Dillenii*. Occasionally, *E. Fl.* 30. Wick of Hagdale, flowers cream coloured and crimson. *Beeby*, 1888.

A very pale-flowered plant occurred on the serpentine at Balta in 1920, with the hairs on the stem appressed.

647. LOTUS CORNICULATUS L. (F.). Common, *E. L.* and preface xxiv. Unst, *C. C.* Burrafirth and Asta Voe, *Beeby*. Setter. Bressay. Mousa.

Forma GRANDIFLORA. Among rocks south of Sand Voe. *Beeby*, 1890. Altered to var. *crassifolia* in *Beeby Hb.* This is probably the forma *carnosa* (Pers.) of the Faroe Flora. Spiggie. Setter, beautiful plants, with large, deep yellow flowers, quite different from the southern *crassifolia*. I suggest the name *grandiflora* should be retained. Clibberswick.

679. VICIA CRACCA L. (F.). Common, *E. L. & Fl.* Burrafirth, *Tate*, 1865. Unst; Sandwick; Yell, *C. C.* Berwick; Sumburgh, *Beeby Hb.* Scalloway. Tingwall. Hoo Field. Bressay. Sumburgh. Haroldswick. Norwick. Westing. Particularly large-flowered and of a deep indigo colour on the cliffs of Burrafirth and at Spiggie. The leaflets, especially those of the Burrafirth plant, have appressed hairs. I call it forma *pulchra*. It also occurs on the Sands of Barry, Forfar.

688. V. SEPIUM L. Sparingly at upper end of Tingwall Loch, *Beeby* in *Scot. Nat.* 34, 1889. On various holms on Burga Water, etc., 1907; holm in Clousta Water, *Beeby*. Burrafirth, 1920. Bressay. Sandwick. Balta. Norwick. Spiggie. A broad-leaved, luxuriant plant. I suspect once cultivated for fodder.

†697. V. SATIVA L. Alien. Occasionally as a cornfield weed in Unst, Scalloway, *Beeby*.

†698. V. ANGUSTIFOLIA Reich. Unst, *West*.

712. L. MARITIMUS Big. Sand down, Burrafirth, 1837, *E. L.* Abundant in a circumscribed locality on the sands of Burrafirth, *E. Fl.* Abundant, barren, *C. C.* Only a few barren shoots, *Beeby*, 1886. The Shetland plant, not known elsewhere, is named var. *acutifolius* Bab. I have a specimen sent by Edmondston in 1841 to the Bot. Exch. Club, but was unable to find it after several attempts.

714. LATHYRUS PRATENSIS L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Haroldswick, *Tate*. Mid Yell Voe; Burga Water; Tingwall; Scalloway, *Beeby*.

Var. *SPECIOSA Druce in Rep. Bot. Exch. Club 19, 1920, as forma. Differs from the English plant in its much larger flowers—corolla, 16-20 mm. long; flowers 8-10 in a cluster. A form approaching this occurs in Bute. Tingwall. Burrafirth.

[*Pisum sativum* L. Alien. (F.).]

719. L. MONTANUS Bernh. Hill of Voesgarth, Unst; Mavisgrind, North Maven, *E. Fl.*

746. SPIRAEA ULMARIA L. (F.). Unst; Fetlar, etc., generally distributed, *E. L. & Fl.* Belmont, Unst, *C. C.* Mailand!, *Beeby.* Burga Water. Lerwick. Loch of Cliff.

Var. DENUDATA Presl. Mailand Burn, Unst, 1887, *Beeby.*

748. RUBUS IDAEUS L. Ravine of Eala Water burn, *Beeby*, 1892, and *Hb.*

[*R. fruticosus* L. One patch in a pasture field, *West.* This is a corylifolian form escaped from cultivation.]

879. R. SAXATILIS L. (F.). Ollaberry, North Maven, *E. Fl.* Springfield, Unst!; Ronas Hill, 50-1450 ft.!, *Tate.* Balta Sound!, *C. C.* Ken of Hamar!; Cloustu Voe, fruiting; on sea banks near Sandsting; Felta Burn, *Beeby.*

Var. BOREALIS West in *Journ Bot.* 300, 1912. A starved form reduced to about an inch high, *West.* This is a barren plant, the underground stem throwing up a leaf at intervals on the serpentine the leaves being of a purplish-chocolate colour. Tate collected exactly the same plant in 1865 at Buness.

[*Dryas octopetala.* (F.).]

883. GEUM RIVALE L. (F.). West side of Tingwall Loch!, *Beeby* in *Scot. Nat.* 212, 1888. Holm in Sandsting; Mousa Vord Loch. *Beeby.* Common on stream banks, Voe, *Henderson.*

886. FRAGARIA VESCA L. (F.). Unst; Scalloway; Cunningsburgh; Busta, *E. Fl.* Vallafield, Unst, *C. C.*

890. POTENTILLA ANSERINA L. (F.). Common, *E. L. & Fl.* Lerwick, 1865, *Tate.* Yell; Unst, *C. C.* Scalloway; Colvadale; Whiteness Voe, *Beeby.* Haroldswick. Uyea. Fedaland. North Roe. Sandwick. Spiggie. Bressay. Mousa, etc.

Var. *NUDA S. F. Gray. Scalloway. Bressay. Sumburgh. Isle of Balta.

903. P. ERECTA Hampe. (*Tormentilla*). (F.). Common, *E. L. & Fl.* Tingwall, *Tate.* Mousa!; Ronas Hill!; Yell; Unst, *C. C.* Ollaberry, *Beeby.* Bressay. Gallow Hill. Hermaness. Saxavord, etc.

[Var. *nemoralis.* Error. Scalloway, *E. Fl.* Haroldswick (*sic*), *C. C. Tormentilla reptans.* Rare, *E. L.* All doubtless errors for *erecta.*]

[*P. verna* L. (F.).]

907. P. SIBBALDI Hall. f. (F.). Ronas Hill, *E. Fl.*

908. P. PALUSTRIS Scop. (F.). Common, *E. L. & Fl.* Lund!, 1865, *Tate.* Queyfirth; Ollaberry; Asta!, *Beeby Hb.* Spiggie. Scalloway. Laxfirth. Walls. Cunningsburgh. Bressay. Mousa. Uyea Sound. Watlee. Haroldswick. Loch of Cliff.

[909. ALCHEMILLA VULGARIS L., aggregate. Ollaberry, *E. L. & Fl.* xiii. Tingwall, *Tate.* Unst, rare, *West.* These belong to *A. filicaulis* Buser, which I put under *A. minor.*]

908 (2). A. MINOR Huds. (F.). Tingwall, 1865, as *vulgaris*, *Tate* in *Hb. Druce.* Setter Voe in Clousta; Sandsting; Estwick Burn: Ollaberry; holm in a small loch on Gibbies Law Burn; Tingwall; Kirkhouse Burn Voe; Delting; Keryard Burn, Windale; frequent among rocks on Hoo Field, 90 m., as *subsericea*, *Beeby.* All passed as sub-species *filicaulis* (Buser) by Lindberg, the Hoo Field being var. *vestita* Buser. I could not see it on Hoo Field. Brousta, 1921.

*909 (3). A. ALPESTRIS Schmidt. Balta, Unst, 1921, in a pasture near the Queen's Hotel. Perhaps of garden origin, as I was unable to see it elsewhere, although I was told it was wild in the island. I saw it in gardens.

†910. A. ARGENTEA Don (*conjuncta* Bab.). Alien. On the lawn of the Queen's Hotel, Balta Sound, *Beeby* in *Scot. Nat.* 168, 1907. Still there in 1920 and 1921, but evidently planted. A plant or two was seen in an adjoining pasture.

[*A. faroensis* Buser and *A. acutidens* are found in the Faroes.]

911. A. ALPINA L. (F.). Ronas Hill, *Fl.* xiii. Ronas Hill, at 1000-1460 ft., *Tate.*

912. A. ARVENSIS Scop. Buness, 1865; Balta Voe; Tingwall, *Tate*, 1866. Unst, *C. C.* Sandwick: Hillswick: Skelberry: Balta Sound, *Beeby Hb.* Laxfirth.

[926. *Rosa lutetiana* Lem. Tate's Burrafirth specimen is not *canina*. See Watson, *l.c.* *R. canina*, one plant at the edge of an enclosed pasture, Unst, *West*, is an alien or error. Beeby's *R. dumalis* (*Scot. Nat.* 214, 1890) is also cancelled. It is a *glauca* form. Restricted *R. canina* needs confirmation.]

934. R. GLAUCA Vill. This is probably the *R. canina* from Ronas Hill of the *Flora*, p. 35, where Beeby found *glauca*. Setter Voe. Clousta. Hamari Water. Burga Water. Cliva Hill. Mavisgrind. East side of Loch of Cliff. In this the armature is very mixed, suggesting the presence of *R. spinosissima.*

Var. SUBCRISTATA (Baker). Edge of cliff, Ronas Voe, *Beeby.*

941. R. TOMENTOSA Sm. Abundant, *E. L.* Burrafirth; Lund; North Roe, *E. Fl.* Very rare.

[*R. mollis* is reported from the Faroes.]

957. PYRUS AUCUPARIA Ehrh. Precipices and cliffs, *E. L.* North Roe!; Ronas Voe!, *E. Fl.* Grud Burn; Björgs of Skelberry. These are the var. *glabra* Trautv. See Beeby in *Scot. Nat.* 214, 1890. On the holm in Hamari Water, flowering and fruiting, 1907; Hostigates, *Beeby.* Ronas Voe, by the Fealburn, 1920. Burga Water.

†966. CRATAEGUS MONOGYNA Jacq. Alien. Planted, Tingwall, *E. L. & Fl.*

975. SAXIFRAGA OPPOSITIFOLIA L. (F.). Sand Voe: Fitful Head, *E. L. & Fl.* Lee of Setter: Fedaland: moor between Skelberry and North Roe, *Beeby Hb.*

[*S. decipiens*, *S. hypnoides*, *S. nivalis*, *S. rivularis*, and *S. stellaris* occur in the Faroes.]

1000. PARNASSIA PALUSTRIS L. Not uncommon, *E. L. & Fl.* Tingwall, *Tate.* Unst, *C. C.* Spiggie, *Beeby.* Balta. Tingwall. Laxfirth. Brousta. Lee of Setter. Bressay.

Var. *CONDENSATA Trav. & Wheld. Spiggie.

†1010. SEDUM TELEPHIUM L. Rare, *E. L.* Collafirth, North Maven; Tresta, Fetlar, *E. Fl.* I only saw it as a garden straggler at Brousta. Alien in Shetland.

[1019. *S. anglicum* Huds. Near Fedaland, North Maven; Colvadale, Unst, *E. Fl.* Needs confirmation.]

1025. S. ROSEUM Scop. (*Rhodiola*). (F.). Common, *E. L.* Not unfrequent on maritime rocks, Burrafirth!; Ronas Voe!, *E. Fl.* Balta Isle!, *Saxby Fl.* Cliffs of Clibberswick. Hagdale. Very beautiful.

[*S. villosum* is recorded for the Faroes.]

1027. DROSERA ANGLICA Huds. (as *longifolia*). Lamhoga, Fetlar; Yell, *E. L.* Burravoe, Yell, *E. Fl.* Rools Burn, near Collafirth, 1890; south side of Roenwater Loch, North Maven, *Beeby.*

1029. D. ROTUNDIFOLIA L. (F.). Not unfrequent, Yell; Bressay; Fetlar; North Maven, *E. L.* Haroldswick, Unst, *E. Fl.* Hermaness!, *Tate.* Ulsta, Yell; Hillswick; Scalloway; Rools Burn, *Beeby.* Saxavord. Watlee. Gallow Hill, etc.

× D. OBOVATA M. & K. Rools Burn, *Beeby*, 1889.

[*D. intermedia*, *Saxby Fl.* It is an error for *D. anglica.*]

1030. HIPPURIS VULGARIS L. Common, *E. L. & Fl.* Unst; Mainland, *C. C.* Mailand Burn!, *Beeby.* Peat moor near Haroldswick. Norwick.

[1032. *Myriophyllum spicatum* L. Given in the *List* but rightly omitted from the *Flora* by Edmondston.]

1033. M. ALTERNIFLORUM DC. (F.). Loch of Cliff, 1865, *Tate.* Uyea Sound!; Little Setter Loch, Yell; Tingwall!, *Tate.* The only form seen, *Beeby.* Spiggie. Bressay. Watlee. Brousta, etc.

1035. CALLITRICHE STAGNALIS Scop. (F.). In a ditch at Bakkasetter, Dunrossness, for the first time, *Beeby* in *Scot. Nat.* 28, 1891. Unst and Ollaberry, *West*. Bressay. Mousa. Uyea Sound. Haroldswick. Watlee, etc.

Var. *SERPYLLIFOLIA Lönnr. Sundabanks. Cliva.

1035 (2). C. PLATYCARPA Kuetz. Loch of Tingwall and elsewhere, *E. Fl.* Balta Sound, *Beeby*. Haroldswick.

[1037. *C. verna* L. Pools and ditches, common, *E. L.* 37, is an aggregate. The segregate needs discovery.]

1038. C. POLYMORPHA Lönnr. In the Mailand Burn, Unst, apparently abundant, *Beeby* in *Scot. Nat.* 212, 1888, and first record for Britain. Burn of Sundabanks, Scalloway!, *Beeby*, 1889. Very sparingly in the Mailand Burn and barren, 1920 and 1921. In small quantity at Sundabanks in fruit, 1921. Near Coultsmill, abundant but mostly barren. Near Haroldswick. Norwick. The large, yellowish-green leaves are distinguishing features. It appears to be confined to slow, peaty streams and ditches. In most instances it was associated with *intermedia* and *stagnalis*.

1039. C. INTERMEDIA Hoffm. (*hamulata*). (F.). Bressay; Unst, etc., *Tate*. Mailand Burn, abundant!; Ollaberry; Eala Water, 1886, *Beeby*. Near Burga Water. Haroldswick.

1040. C. AUTUMNALIS L. (F.). Abundant, *E. Fl.* Loch of Cliff!; Watlee Burn!; Asta!; Tingwall!, *Beeby* in *Scot. Nat.* 213, 1888. Belmont, *Henderson*. Bardister. Near Longa. Spiggie.

1046. EPILOBIUM ANGUSTIFOLIUM L. (F.). Not common, *E. L.* Cliffs, Ronas Hill; Burrafirth, *E. Fl.* Geosetter Burn; St Ninian's Bay, *Beeby*. W. R. Linton refers the Burrafirth plant to var. *brachycarpum*. It is cultivated in gardens. [Flowerless or nearly so in the Faroes.]

1051. E. OBSCURUM Schreb. Fair Isle. *Eagle Clarke* in *Ann. Scot. Nat. Hist.*, 167, 1906.

1054. E. MONTANUM L. (F.). Snarra Voe, Unst, *E. L.* Belmont; Laxfirth, *E. Fl.* Fair Isle, *Straker.* Sundabanks; Bressay; Burravoe; Yell, *Beeby.* On walls at Lerwick. Scalloway. Uyea.

1055. E. ALSINIFOLIUM Vill. (F.). Ronas Hill, *C. C.*, 1870.

1057. E. PALUSTRE L. (F.). Frequent, *E. L. & Fl.* Ness, N. Yell, *Tate.* Unst, *C. C.* Asta Voe!; Breiwick; Saxavord!; Clousta; Collafirth; Tingwall!, *Beeby.* Mousa. Spiggie. Setter. Laxfirth. Sumburgh. Coultsmill. Vinstrick. Burrafirth. Haroldswick, etc.

Var. FONTANUM Hausskn. (F.). With large flowers (⅜ in.) on south side of Ronas Voe!, *Beeby.* Spiggie. Tingwall.

Var. LAVANDULIFOLIUM Lec. & Lam. Clickhimmin Loch!; Burrafirth, *Beeby.* Bressay. Coultsmill. Skaa. Vinstrick.

Var. LINEARE Kraus. Bressay. Lund.

[*E. lactiflorum* Hausskn. and *E. alpinum* L. (F.).]

1078. HYDROCOTYLE VULGARIS L. Common, *E. L. & Fl.* Unst; Yell, *C. C.* Scalloway, *West.* Sundabanks!, *Beeby.* Burga Water. Mousa. Dunrossness. Uyea. Haroldswick.

1081. ERYNGIUM MARITIMUM L. Rare. Tangwick, North Maven; east shores of Bressay, *E. Fl.* Fitful Head, *Rev. W. E. Smith.* See *Journ. Bot.* 301, 1884.

[1086. *Conium maculatum* L. Error. Not common. Shady situations, *E. L.* Omitted from the Flora.]

†1103. CARUM CARVI L. Wet meadows, etc., near Mid Yell, etc., *E. Fl.* Clickhimmin, *Tate.* Scousburgh; between Boddam and Exnaboe; Quendal, *Beeby.* Spiggie and Sumburgh, in several places, quite naturalised. Near Jarl's House. Plentiful round the Parish Church, Balta Sound. Doubtless of alien origin although now looking like a native.

1111. SIUM ERECTUM Huds. (*angustifolium*). Asta Burn!, *Beeby* in *Scot. Nat.* 34, 1889.

†1112. AEGOPODIUM PODAGRARIA L. Alien, as in Faroes. Garden weed at Ollaberry, *Beeby*, and at Lerwick and Balta.

1115. CONOPODIUM MAJUS Loret. Voesgarth, Unst, *Tate*, 1886.

†1123. SCANDIX PECTEN-VENERIS L. Alien. Shetland, *Evans* in *Scot. Nat.* 189, 1891.

1126. ANTHRISCUS SYLVESTRIS Hoffm. Common, *E. L. & Fl.* Balta Sound, *C. C.* Widely distributed in Shetland north to Burrafirth as the var. **angustisecta* Druce, as at Spiggie, Sumburgh, Sandwick, Walls, Lerwick, North Roe, Muness Castle, Norwick, Balta, etc.

[1127. *A. Scandix* Beck (*vulgaris*). Error. Abundant, *E. Fl.*]

1144. LIGUSTICUM SCOTICUM L. (F.). Not common, *E. L.* Burrafirth!; Isle of Balta; Maiden Stack, North Maven, *E. Fl.* Hermaness!; Ollaberry, *Tate*. Wick of Hagdale!, *Beeby*. Swinna Ness, Unst; Aith Voe, *Beeby Hb.* Spiggie Voe. Mousa. At Burrafirth and Spiggie it grew in the sand.

1147. ANGELICA SYLVESTRIS L. (F.). Common, *E. L. & Fl.* Loch End; Scalloway, *C. C.* Loch of Cliff; Foula, *Beeby*. The Shetland plant appears to be the var. **decurrens*. It occurs at Spiggie, Dunrossness, Tingwall, Sundabanks, Tingwall, Mousa, Bressay, Saxavord, Hermaness, Skaa, Westing, etc., but the character is not always strongly marked. The unopened inflorescences on a dwarf plant have a strange appearance.

[*Archangelica officinalis* occurs in the Faroes.]

[1151. *Peucedanum sativum* B. & H. Error. Waste ground, not common, *E. L.* Omitted in the *Flora*.]

†1152. P. OSTRUTHIUM Koch. Alien. A patch in the croft of Setter, near Walls, *Beeby*, 1907.

1154. HERACLEUM SPHONDYLIUM L. Common, *E. L. & Fl.* Mid Yell Voe, 1887; Scalloway, a weed of cultivation, *Beeby*. Not unfrequent in rich ground, *Saxby Fl.* Tingwall. Whiteness. Walls. Lerwick. Bressay. Dunrossness. Uyea Sound. Not uncommon.

[1160. *Daucus Carota* L. Error. Abundant, *E. L. & Fl.* Best excluded, *Beeby.*]

†1172. HEDERA HELIX L. ? Alien. On a Pictish Broch, Walls, *E. L. & Fl.* I did not see it.

1174. CORNUS SUECICA L. (F.). At 1400 feet on Sneug, Foula, *Beeby* in *Scot. Nat.* 213, 1888.

†1178. SAMBUCUS NIGRA L. Alien. Only in gardens!, *West.*

1186. LONICERA PERICLYMENUM L. Cliffs, not common, *E. L.* Burrafirth; North Roe; Sundabanks Ravine; near Scalloway, *E. Fl.* Ronas Voe!; Hamari Water; Dall of Lumbister, Yell, *Beeby.* Hoo Field.

1192. GALIUM BOREALE L. Not common, *E. L.* Vallafield Burn, Unst; North Roe, *E. Fl.*

1195. G. HERCYNICUM Weig. (*saxatile*). (F.). Common, *E. L. & Fl.* Bressay!, *Tate.* Unst; Yell; Mainland, *C. C.* Scalloway; Eala Water; Ollaberry; Foula, *Beeby Hb.* Laxfirth. Luxuriant at Setter. North Roe. Mousa. Vallafield. Hermaness.

[1197. *G. uliginosum* L. Error? Frequent, *E. Fl.* and *Saxby Fl.* Sought in vain by Beeby and Druce.]

1198. G. PALUSTRE L. (F.). Common, *E. Fl.* Tingwall; Breiwick, *Tate.* Scousburgh; Clousta, *Beeby.* Laxfirth. Mousa. Uyea Sound. Burrafirth.

Var. MICROPHYLLUM Lange. Loch of Cliff, Unst!; Clickhimmin Loch, *Beeby*, 1886. Watlee.

Var. WITHERINGII (Sm.). Abundant, *E. Fl.* Fair Isle, *Straker.* Loch of Setter, *Beeby.*

1199. G. VERUM L. Common, *E. L. & Fl.* Unst; Yell; Mainland, *C. C.* Tingwall, *Tate.* Ronas Voe, *Beeby Hb.* Hoo Field. Sumburgh. Burrafirth.

1202. G. APARINE L. (F.). Sea shore, common, *E. L.* Balta!;

Uyea; Haroldswick, *Tate*, 1866. Gutcher, Yell; Asta Voe, *Beeby*. Lerwick. Mousa. Haroldswick.

†1207. ASPERULA ODORATA L. Bardister, North Maven, *E. Fl.* Rivulet at Balta Sound, probably a garden escape, *Saxby Fl.* Alien in both cases.

†1222. VALERIANELLA OLITORIA Poll. Colonist, Norwick, Unst, *Tate*, 1866. Still there, 1921.

1237. SCABIOSA SUCCISA L. (*S. pratensis* Moench). (F.). Common, *E. L. & Fl.* Bressay, *Tate*. Unst; Mainland, *C. C.* Near the whaling station and elsewhere it gives a sheen to the landscape, *West*. Burrafirth!; Hamar Voe; Dales Voe!, etc., *Beeby*. Asta. Hoo Field. Bressay. Mousa. Balta Isle.

[*S. arvensis* L. (F.).]

1243. SOLIDAGO VIRGAUREA L. Common, *E. L.* Eala Water, type, on rocks, passing into *cambrica*; Loch of Cliff, *Beeby*. Sundabanks. Lee of Setter. Skaa.

Var. CAMBRICA (Huds.). Dry places on hills, common, *E. Fl.* I should refer no Shetland *Solidago* to Hudson's Welsh plant. I call the condensed cliff and montane form var. *Plukenetiana*. It occurs at Hoo Field, Lee of Setter, and the ravine of the Eala Water.

1248. BELLIS PERENNIS L. (F.). Very common, *E. L. & Fl.* Unst; Yell; Mainland, *C. C.* Balta; Scalloway; Fethaland, *Beeby*. Bressay. Mousa. A fasciated form with two discs occurred at Balta. It was a deep red colour = var. *colorata* Peterm.

1270. ANTENNARIA DIOICA Gaertn. Frequent, *E. L. & Fl.* Muckle Heog!, *Tate*. Unst; Ronas Hill!, *C. C.* Vaila; Whiteness; Balta!; Colvadale!, *Beeby Hb.* Gallows Hill. Haroldswick. Skaa. North Roe.

1274. GNAPHALIUM ULIGINOSUM L. Upper Sound, Lerwick, *E. Fl.* Ollaberry, *Tate*. Haroldswick!, *C. C.* Scalloway, *West*. Fair Isle, *Straker*. Skelberry; Vaara Loch; Sandsting, *Beeby Hb.*

1275. G. SYLVATICUM L. Near the Burn of Sundabanks!, *C. C.*

Ollaberry, *West*. Lochside, Walls; Tingwall!; Whiteness Bay, *Beeby*. Burrafirth!, *Tate*. Ronas Voe. Balta. Haroldswick. Norwick.

[1276. *G. norvegicum* Gunn. Error. Tingwall and Burrafirth, *Tate*. These are *sylvaticum*.]

[1277. *G. supinum* L. (F.). Ronas Voe, *E. Fl.*, xiii. Ignored in Hooker's *Stud. Fl.* Needs confirmation.]

1329. ACHILLEA MILLEFOLIUM L. (F.). Common, *E. L. & Fl.* Lund, Unst, *Tate*. Mainland, *C. C.* Tingwall; Southwick; Uyea; North Maven; Sullum Voe, *Beeby*.

Var. ALPESTRIS Koch. Burrafirth Cliffs, *Beeby*.

Var. LANATA Koch. Fair Isle, *Beeby*. Sandness. Sumburgh.

Forma *ROSEA. Sumburgh, a pretty, neat plant.

1334. A. PTARMICA L. (F.). Frequent, *E. L. & Fl.* Yell; Unst; Mainland, *C. C.* Tingwall!, *Tate*. Mid Yell, *Beeby*. Balta. Lerwick. Bressay.

[1347. *Anthemis Cotula* L. Error. Tingwall, *E. Fl.*]

†1351. CHRYSANTHEMUM SEGETUM L. Lerwick, *E. Fl.* Scalloway, *Beeby*.

†1353. C. LEUCANTHEMUM L. (F.). [Frequent, *E. L. & Fl.* An error.]. In one or two places in Unst, *Mr Sandison*. One plant in a meadow near Ollaberry, 1890; Walls, *Beeby Hb.* Not infrequent near cultivated ground, probably introduced, *Saxby Fl.* Garden ground, Lerwick, 1921. An alien in Shetland and in the Faroes.

1359. MATRICARIA MARITIMA L. Stony shore of North Roe, 1892; Breiwick, *Beeby*, who considers it distinct from *inodora*.

1360. M. INODORA L. Common, *E. L. & Fl.* Lund, *Tate*. Mousa; Unst, *C. C.* Brae; Gulcher, *Beeby*. Lerwick. Bressay.

Var. PHAEOCEPHALA Rupr. (F.). Between Balta Sound and Loch of Cliff!, 1892; Breiwick; West Voe of Sumburgh, *Beeby*. Bressay, *Lester-Garland*. Spiggie. Leafirth. Whiteness. Burga

Water. Uyea Sound. Norwick. Sumburgh. Setter, etc. Often very luxuriant; specimens nearly a yard high at Haroldswick. Flowers attain 50 mm. diameter. The plant is a conspicuous feature.

†1362. M. SUAVEOLENS Buch. Alien. Balta Sound, *West*, 1912. Sumburgh. Frequent at Lerwick. Walls. Scalloway. Ronas. Near the lighthouse station, Hermaness. Scalloway. Sandwick. Uyea Sound. Norwick. Haroldswick.

This North American alien threatens to be a most abundant weed in the islands. It is introduced with fowl-corn.

†1366. TANACETUM VULGARE L. (F.). Alien. Near houses, common, *E. L. & Fl.* Balta Sound, *Tate*. Burrafirth, *C. C.* Wild in N. Yell, *Watson*. Perhaps wild near Bardister, *Beeby*. Setter. Muness. Haroldswick. Uyea. Skaa.

A relic of cultivation or a garden escape.

[†1367. ARTEMISIA ABSINTHIUM L. Alien or error. Quendal; Dunrossness, *E. Fl.*]

1368. A. VULGARIS L. Common, *E. L. & Fl.* Unst: Mainland, *C. C.* Ollaberry; Whiteness; Cunningsburgh, *Beeby*. Sandwick.

Var. *COARCTATA Fors. Norwick.

†1384. TUSSILAGO FARFARA L. (F.). Not common, *E. L.* Tresta, Fetlar; Bardister, North Maven, *E. Fl.* Ollaberry, *Tate*. Scalloway!, *Beeby*. Balta Sound, *Saxby Fl.*, but of garden origin, teste Mrs Saxby, 1920.

†1385. PETASITES OVATUS Hill. Not uncommon [Error], *E. L.* Ollaberry, *E. Fl.* A mistake for *T. Farfara* which grows there, *Tate*. Knabb, Lerwick, *Beeby*. Doubtless introduced. I could not find it in 1921.

1393. SENECIO AQUATICUS Huds. Not rare, *E. L. & Fl.* Mousa; Unst, *C. C.* The *S. Jacobaea* of the *Flora*, described as " far too common but rare in Unst," is doubtless a form of this species. Fair Isle, *Straker*. Scalloway; Sumburgh Loch; Tingwall; Asta; Sandwick, *Beeby*.

Var. *ORNATUS Druce in Rep. Bot. Exch. Club 25, 1920. In July 1921 when entering the harbour of Lerwick one was anxiously trying to identify the first plant of Ultima Thule. Patches of a bright yellow in cultivated soil suggested *Chrysanthemum segetum* but a subtle difference in colour made one doubt. After landing a visit was made to investigate the vegetation more closely when it was found that the colouring was due to another Composite, *Senecio aquaticus*, which, as its name suggests, grows with us in wet and in undisturbed grass of meadows and marshes. Here it chose ground of which the original covering had been removed or in which the soil itself had been disturbed by man. This showy plant, much more ornate than its Southern prototype, was common on the derelict fields around a crofter's cottage, on parts of moorland which had been prepared for corn, on waste places by road-sides, in poor garden ground or the bare stony shores of inland lochs. The plants were usually short, about 8 cm., and had a conspicuous, flat-topped. corymbose inflorescence of larger flower-heads with showy ray-florets of a slightly deeper tone of yellow. As Beeby remarked, " it grows as an inverted pyramid with flat-topped inflorescence." Occasionally the plants are clothed with a hoary or arachnoid tomentum. The lower leaves are usually but little cut, indeed often sub-entire, and are usually green beneath. The capitula are up to 43 mm. across We saw it not only by Clickhimmin Loch and in waste ground about Lerwick, the Mainland, Tingwall, Whiteness Voe, near Walls and Sandwick, but also in Unst at Burrafirth and Balta Sound. The plant had an unmistakable facies of its own and it seems well worth segregation.

1394. S. JACOBAEA L. The plant of the *Flora* is a form of *S. aquaticus*. One plant in a garden at Balta Sound, 1888 ; abundant on cliffs east of Scalloway, 1889, denizen, *Beeby*. Still there in 1921. Ollaberry, very local, *West*. Belmont (with some doubt), *Saxby Fl.* Lerwick. one specimen.

A supposed hybrid of *aquaticus* and *Jacobaea* was found by Beeby with both parents at Scalloway. Probably *Jacobaea* is not native in Shetland but was introduced at no very distant date. It is not in the Faroes.

1401. S. VULGARIS L. (F.). Everywhere common, *E. L. & Fl.*

Unst, *C. C.* Scalloway, *Beeby.* Spiggie. Tingwall. Lerwick, too abundant. Bressay. Dunrossness. Sandwick mines. Muness. Balta.

Often as a very stout, upright and rather handsome plant.

1421. ARCTIUM MINUS Bernh., as *A. Lappa.* Rare, but frequent, in Dunrossness, *E. L. & Fl.* Recorded as *A. intermedium* from Sumburgh Links, *Beeby.* See correction in *Ann. Scot. Nat. Hist.* 105, 1909. Near Jarl's House, Sumburgh.

†1422. CARDUUS NUTANS L. Alien. A solitary plant on the beach at Balta Sound, *Evans* in *Scot. Nat.* 189, 1891.

1427. CIRSIUM LANCEOLATUM Scop. Much too abundant. *E. L. & Fl.* Unst, *C. C.* Scalloway, *Beeby.* Lund. Bressay. Mousa.

1433. C. ARVENSE Scop. (F.). Common. *E. L. & Fl.* Unst; Mainland, *C. C.* Dale Voe, *Beeby.* Balta Isle. Recently introduced in the Faroes.

†Var. SETOSUM Mey. Alien. Ness, N. Yell, 1865. *Tate.* Near Brechin, Yell, *A. Griffith.*

1434. C. PALUSTRE Scop. (F.). Common. *E. Fl.* Unst; Yell; Mainland, *C. C.* Ollaberry, *West.* Asta Voe. *Beeby.* Mousa. Bressay.

Var. *FEROX Druce. Balta. Burrafirth. Westring. Tingwall. Sandwick. Delting. Ronas Voe. Laxfirth. Spiggie. Bressay. Rather common.

†1439. ONOPORDON ACANTHIUM L. Alien. Not common. *E. L.* Perhaps introduced. *E. Fl.* Only a garden straggler.

1445. SAUSSUREA ALPINA DC. Ronas Hill, 1837. *E. L.* One specimen in flower, 1889. Somewhat frequent on stony ground about the top, the stem under two inches high, *Beeby.*

1451. CENTAUREA NIGRA L. Alien. Balta Sound, *E. Fl.* Top of low cliffs, Sand Voe, doubtfully indigenous. *Beeby.*

†1454. C. CYANUS L. Perhaps introduced. *E. Fl.* Levenwick, in

the corn crops, *Beeby*, 1907. An adventitious species, not in the Faroes.

1484. LAPSANA COMMUNIS L. Undercliff, western shore of Sullum Voe, near Lunnister, *Beeby* in *Ann. Scot. Nat. Hist.* 54, 1892.

†1497. CREPIS CAPILLARIS Wallr. Alien. As *C. virens*, naturalised within the enclosure of St Magnus Hotel, Hillswick, 1907, but likely introduced in building operations, *Beeby*.

[Edmondston in the *Flora* includes *Hieracium denticulatum* and *H. murorum*, the former from Cliff, the latter from North Roe, but their identity can only be guessed at.]

[1515. *Hieracium flocculosum* Backh. Shetland, *Ann. Scot. Nat. Hist.* 169, 1907, was withdrawn by Beeby. See *l.c.*, 116, 1908. Tate's *H. floccosum* (*Journ. Bot.* 6, 1866) is not this species.]

1540. H. SCHMIDTII Tausch. Cliffs, north side of Ronas Voe, 1890; lower end of Grud Burn, and, as an aggregate, from Clousta northwards, *Beeby*, *l.c.*, 1908.

Var. CRINIGERUM Fr. Björgs of Skelberry; also north side of Ronas Voe, *Beeby* in *Scot. Nat.* 54, 1892. This is probably Tate's *floccosum* of 1866. Hochsetter, *Beeby*.

Var. FEALENSE Beeby. Near the croft of Feal, 1908. This is probably the *lasiophyllum* of Tate (see Syme *E. B.* v., 186), teste *Beeby*, *l.c.*, 112, 1908. Still there in 1920.

[1542. *H. rubicundum* Hanb., var. *Boswelli* Linton Brit. Hierac. Shetland is given on the authority of E. F. Linton. It is referred to *H. Schmidtii* by W. R. Linton. See *Ann. Scot. Nat. Hist.* 116, 1908.]

1553. H. OREADES Fr. Foot of Cliva Hill, *Beeby* in *Ann. Scot. Nat. Hist.* 54, 1892. This is the var. *subglabratum* F. J. H. See *Ann. Scot. Nat. Hist.* 112, 1908. It was thought at one time to be *buglossoides*. The *orimeles* of F. J. H. is the same thing. See *Beeby*. *l.c.*, 116, 1908.

[1565. *H. murorum* L. North Roe, *E. Fl.* This is a mistake for *Schmidtii*.]

Var. MICRACLADIUM (Dahlst.). Among crags, west of Feal. This is the plant formerly referred to *duriceps*, teste *Beeby*, *l.c.*, 112, 1908.

1591. H. FARRENSE F. J. H. North side of Ronas Voe in two places; opposite Heylor, among crags, 400-450 ft., 1892, *Beeby*.

[1598. *H. duriceps* F. J. H. See var. *micracladium*, yet W. R. Linton, *l.c.*, 235, 1906, gives Shetland, and Beeby, *l.c.*, 169, 1907, says he has found it but supplies no details.]

[1607. *H. maculatum* Sm. *E. Fl.* It is *H. protractum*.]

1617. H. DOVRENSE Fr. Common about the north end of Loch of Cliff and Burrafirth in 1886 and 1887, teste Hanbury, *Beeby* in *Scot. Nat.* 35, 1889. But see *Ann. Scot. Nat. Hist.* 55, 1892, where it is said to be *Friesii*. Hanbury, 1895, says *dovrense* grows on the east banks of Loch of Cliff.

Var. HETHLANDIAE F. J. H. Cliva Hill Rocks, in some plenty!, 1907; Mavisgrind; Burn of Quoys; Catfirth, *Beeby*.

1618 (2). H. BREVE Beeby in Ann. Scot. Nat. Hist. 112, 1908. On granite rocks west of Feal, very rare, *Beeby*, *l.c.* This seems a good species, but I only saw two specimens in 1920. Allied to the Kerry *H. Scullyi*.

1619. H. ZETLANDICUM Beeby in Journ. Bot. 243, 1891. East side of Sand Voe on low hills and banks; low hills east of North Roe!; towards the Ness of Burravoe, *Beeby* in *Ann. Scot. Nat. Hist.* 55, 1892. Confined to North Maven to an area of 2 by 1 miles on gneiss, extending from Burga Taing north to Benegarth. *Beeby*, *l.c.*, 113, 1908. A very distinct species, in nice flower, August 1921.

1621. H. DEMISSUM Strömf., var. PULCHELLIFORME W. R. L. (as *H. pulchellum* in *Scot. Nat.* 35, 1889). Burrafirth; N.-E. bank of Loch of Cliff; by Queyhouse Loch, *Beeby*, *l.c.* In nice flower 1920 and 1921.

Var. AUSTRALIUS Beeby. Loch of Cliff; Burrafirth Cliffs (Tate's *crocatum*), *Beeby*, *l.c.*, 114, 1908.

1622. H. PROTRACTUM Lindeb. Abundant about east side and north end of Loch of Cliff! (west bank, *Hanbury*, 1895); Dall of Lumbister and Mid Yell Voe; rocks north of Mavisgrind!; Cliva Hill!, 1892; in many places from Unst and Yell southwards to Sandsting and Aithsting, 1908, *Beeby*. Probably the *maculatum* of the *Flora* and the *vulgatum* of Tate.

[1623. H. TRUNCATUM Lindeb. The Cliva Hill plant (see *Brit. Hierac.* 75) proved to be *dovrense*, var. *Hethlandiae*, but Beeby, *l.c.*, 169, 1907, says he has found the true plant, and W. R. Linton states Shetland is the only genuine record (*Ann. Scot. Nat. Hist.* 235, 1906). Beeby later described *subtruncatum*, which may mean this.]

1623 (2). H. SUBTRUNCATUM Beeby, *l.c.*, 114, 1918. Abundant on the ferny and rocky banks of Eala Water down to its mouth in Hamar Voe, *Beeby*. Still plentiful there.

[1625. *H. gothicum* Fr. Shetland, *Brit. Hierac*, 77. Lacks authority.]

[1626. *H. stictophyllum* Dahlst. "I have seen specimens from Shetland from Beeby."—*Dahlstedt*. Beeby has no specimen so labelled in his herbarium. See *Ann. Scot. Nat. Hist.* 169, 1907, and 116, 1908, so it is excluded.]

1630. H. RIGIDUM Hartm., var. FRIESII Dahlst. Hamar Voe; Eala Water Burn; banks of Gluss Burn; near Ollaberry, abundant; north end of Loch of Cliff, *Beeby*, *l.c.*, 55, 1892, and 115, 1908.

1632. H. STRICTUM Fr. Shetland, *Beeby*, *l.c.*, 169, 1907. This is the var. *humilius* Beeby, *l.c.*, 115, 1908. Gelli Gill, near Hillswick; Sandsting; holm in Hamari Water, *Beeby*.

1634. H. AURATUM Fr. Ronas Voe and Mavisgrind, *Beeby*, *l.c.*, 55, 1892. (This may include or represent *crocatum*, var. *thulense*.).

1635. H. CROCATUM Fr. [Burrafirth, *Tate*. This is *protractum*.]. North Roe; Ronas Voe, *Beeby*.

Var. VINACEUM Beeby, *l.c.*, 115, 1908. In many places on the north side of Ronas Voe!, *Beeby*.

Var. CONGESTUM Beeby, *l.c.* Burga Taing; North Roe; holm in Burga Water, *Beeby*.

Var. THULENSE (Beeby, *l.c.*, 115, 1908, under *auratum*) mihi. Abundant on the north side of Ronas Voe! ; sparingly on the south side; rocks a mile north of Mavisgrind, *Beeby*. See also *l.c.*, 55, 1892. To me this is not an *auratum* form, so I place it here.

Twenty-two micro species of Hieracia are found in the Faroes. Not one of the Shetland plants is recorded. See Dahlstedt in Warming's *Botany of the Faroes* 625.

1640. HYPOCHOERIS RADICATA L. South side of Dales Voe, *Beeby* in *Scot. Nat.* 215, 1890. Unst, in one place, *West*. Seafield, Lerwick, in some quantity in a lane traversed by cattle.

1643. LEONTODON AUTUMNALE L. (F.). Common, *E. L. & Fl.* Unst ; Mainland, *C. C.* On Ronas Hill ; Scalloway ; Yell ; Sumburgh ; Burrafirth, *Beeby*. So abundant in a field near Haroldswick as to be noticeable for miles.

Var. TARAXACI (L.) = var. PRATENSIS Koch. Hoo Field. Watlee.

1645. TARAXACUM VULGARE Schrank. (F.). Local. Common, Lerwick, *E. Fl.* Walls, etc., *Beeby*. Scalloway. Balta, etc.

[1646. T. PALUDOSUM Schlecht. (as *palustre*). Marshy places on the hills, abundant, *E. Fl.* This is only an aggregate name and may be incorrect.]

1646 (2). T. SPECTABILE Dahlst. Particularly frequent in Sandsting ; never on cultivated land. Previous records of *palustre* belong here. *Beeby* in *Ann. Scot. Nat. Hist.* 169, 1907. First British record. Burga Water! ; Mill Loch of Uyea ; Nesting ; Housetter, Unst ; Limbister, Yell, *Beeby*. Bressay. Scalloway. Lerwick. Balta Sound, etc.

Var. GEIRHILDAE (Beeby, as sub-sp., *l.c.*, 105, 1909). Loch of Girlsta ; east side of Lang Klödi Loch, North Maven ; and elsewhere in Nesting and Weisdale ; Burn of Quoys ; Catfirth, on rocks in the Ravine, *Beeby*. This prefers grassy sides of burns or wet places on the hills. Lerwick. Burga Water. Hoo Field. Gallow Hill. Watlee.

Var. MACULIGERUM (Dahlst.). South Loch of Hostigates and

Clousta; Skula Water; Bridge of Walls, *Beeby*. Lerwick. Balta. Scalloway.

(Many plants are in the hands of Dr Dahlstedt for identification.)

1656. SONCHUS ARVENSIS L. (F.). Common, *E. L.* (omitted in *Flora*). Unst; Yell; Mainland, *C. C.* Scalloway; Balta, *Beeby*. Lerwick. Bressay. Sumburgh. Uyea. Haroldswick, etc.

1657. S. ASPER Hill. Occasionally to the exclusion of *oleraceus*, *Beeby*, 1889. Scalloway; Whiteness; Unst, *Beeby Hb.* Lerwick. Balta Sound.

Var. *PUNGENS Bisch. Scalloway.

1658. S. OLERACEUS L. Frequent, *E. L. & Fl.* Unst, *C. C.* Uncommon; garden weed at Boddam, *Beeby*. Scalloway. Balta Sound. Hardly naturalised.

1664. LOBELIA DORTMANNA L. (F.). Little Setter Loch, Yell; Ronas Hill; Tingwall Loch!; Burra Voe, *Tate*, 1866. Ollaberry, *West*. Helliers Water, Unst, *Beeby Hb.* Burga Water.

1666. JASIONE MONTANA L. Common, *E. L. & Fl.* The type not common. A small form of it between Ronas Voe! and Hillswick; Hildasay; Foula, *Beeby*.

Var. LATIFOLIA Pugsley (*major* Beeby). Common on cliffs by the sea and inland, Burrafirth, *Tate*, 1865. Loch of Cliff!; Ollaberry; Scalloway!, *Beeby*. Spiggie. Hermaness. Lee of Setter, etc.

Forma PALLIDA. Bressay. Mousa.

1675. CAMPANULA ROTUNDIFOLIA L. (F.). Near Laxfirth, *E. Fl.* Between Skelberry and Boddam, 1907, *Beeby*. Very rare.

1684. VACCINIUM ULIGINOSUM L. (F.). Hermaness!, *E. Fl.* Ronas Hill, 600 ft., *Tate*. Saxavord!, *C. C.* Foula, *Beeby*. Very abundant on Hermaness, but almost always barren.

Forma *MICROPHYLLA Lange Consp. Fl. Groenl. 268. Saxavord.

1685. V. MYRTILLUS L. (F.). Common, *E. L. & Fl.* Ronas Hill, *Tate*. Unst, *C. C.* Dales Voe; Bonxie Hill!; Scalloway, *Beeby*. Hoo Field. Balta. Hermaness. Skaa.

Var. (or forma) MICROPHYLLUM (Lange). Saxavord, *Beeby*. This is probably the *pygmaea* of Ostenfeld.

1686. V. VITIS-IDAEA L. (F.). Ronas Hill, *C. C.*, 1868. Abundant on Hoo Field and Bonxie Hill, 800-960 ft., Cunningsburgh, *Beeby*.

Var. MINOR. Ronas Hill; Hoo Field, *Beeby*.

1690. ARCTOSTAPHYLOS UVA-URSI Spreng. Ronas Hill, *E. Fl.* 200-600 ft., *Tate*. Sae Water; Bergs of Kilbarn; Rools Burn, *Beeby*.

1691. A. ALPINA Spreng. Ronas Hill, *E. L.* 200-1800 ft., *Tate*. Sae Water, North Maven, 250 ft., *Beeby*. Yell, a very large plant on the undercliff, *A. Griffith*.

1693. CALLUNA VULGARIS Hull. (F.). Very common, *E. L. & Fl.* Ollaberry, *Tate*. Unst; Yell; Mainland, *C. C.* Culswick; Walls; Gluss Water; Asta Loch!; Foula; Voesgarth Hill!, etc., *Beeby*. Bressay. Mousa. Hoo Field, etc.

Forma *ALBA. Hoo Field.

1694. ERICA CINEREA L. (F.). Common, *E. L. & Fl.* Burrafirth, *Tate*, 1865. Unst: Yell: Mainland, *C. C.* Hillswick: Ronas Voe, *Beeby*. Bressay. The flowers are smaller than the usual southern plant.

1695. E. TETRALIX L. Frequent on dry moors, *E. L. & Fl.* Ronas Hill!, *Tate*. Unst; Yell; Mainland, *C. C.* Burrafirth!; Hillswick, *Beeby*. Bressay. Mousa.

Var. *FISSA Druce. Corolla polypetalous, petaloid stamens. *Tate*. Balta, on serpentine.

1702. LOISELEURIA PROCUMBENS Desv. (*Azalea*). (F.). Ronas Hill, *E. L.* Plentiful there, *C. C.*

1708. PYROLA MEDIA Sw. Walls, *E. Fl.*

[*P. minor* L. is recorded for the Faroes.]

1713. LIMONIUM VULGARE Hill. Knabb, near Lerwick, two or three specimens, *E. L. & Fl.*, as var. *longifolium*. I could not see it.

1721. STATICE PUBESCENS (Link) Druce = S. LINEARIFOLIA Lat. = ARMERIA MARITIMA. Frequent, *E. L. & Fl.* Unst; Yell; Mainland, *C. C.* A viviparous form, Sand Voe, 1906; Burrafirth; Burravoe; Grud Burn, *Beeby Hb.*

In 1887 Beeby recorded a small form as *sibirica* Turc., but in 1888 said it was not true *sibirica.* The Thrift is very variable, some of it coming under var. *scotica* Boiss., and is generally distributed and abundant, especially on the rocky islets.

1721 (2). S. PLANIFOLIA (Syme) Druce. Hill of Hamar!; near Balta Sound; Springfield!; east side of Sand Voe on rocks, *Beeby.* Cultivated side by side with type since 1898. In addition to recorded characters it flowers three weeks earlier than type, *Beeby*, *l.c.*, 233, 1907. As Mr Clement Reid has shown, this seems to be a good species. I am able to corroborate Beeby's statement as to the earlier flowering.

[*S. maritima*, *sibirica*, and *elongata* are recorded from the Faroes and should be sought for.]

1725. PRIMULA VULGARIS Huds. (F.). Common, *E. L.* Lund!, Unst; Ollaberry; Bardister!; Reafirth; Mid Yell; near Cunningsburgh!, etc., *E. Fl.* Burravoe, *Tate.* Tingwall!; Dales Voe!, *Beeby.* Petester!; near Olligarth House; Whiteness, *Saxby Fl.* Burn of Sundabanks. Cliva. Eala Water. Hoo Field. Mousa, in flower in August.

1740. TRIENTALIS EUROPAEA L. Hermaness, Unst, *E. L. & Fl.* Foula, *R. M. Barrington.* Noss, *Beeby*, 1898. Braefield, Dunrossness, *Mrs J. M. Saxby.* Very small specimens, my var. *nana.* See *Rep. B.E.C.* 75, 1882.

1741. GLAUX MARITIMA L. Common, *E. Fl.* Yell; Unst, *C. C.* Balta Voe!, *Tate.* Asta Voe; Tangwick; Collafirth, *Beeby.* Sumburgh. Virkie. Bressay.

1744. ANAGALLIS TENELLA Murr. (F.). Norwick, Unst; Sound, Lerwick, *E. Fl.* Burrafirth, *C. C.* Spiggie; Grasswater, *Beeby.*

[*Lysimachia nemorum* L. (F.).]

1755. CENTAURIUM VULGARE Rafn. = ERYTHRAEA LITTORALIS. Sullum Voe; Tangwick; North Maven, *E. Fl.*

[1756. *C. umbellatum* Gilib. = *Erythraea Centaurium*. Belmont, Unst, *E. Fl.* Very dubious.]

1763. GENTIANA AMARELLA L. Not common, *E. L.* Generally distributed on limestone and sandy pastures: Cliff and Burrafirth; Balta Island!; Tingwall!; Dunrossness!, *E. Fl.*

Forma MULTICAULIS Lange. Burrafirth sands and adjacent banks!; Sconsburgh, *Beeby*.

The Shetland *Gentiana Amarella* is sufficiently distinct from the English form as to be worth designating *G. septentrionalis* nova subsp. or race. The plants are usually more branched. The colour of the corollas is quite different. Externally they are of a pale dull red, while internally the lobes are whitish, either with a trace of dull rose, or very pale grey, but the effect conveyed when they are fully expanded on a sunny day is of pale whitish stars, and is quite beautiful. There is no suggestion of the bluish-purple which is characteristic of the English plant. When the calyx-segments are as long as the corolla as I have seen at Burrafirth and on the Caithness coast at Reay, etc., it is the var. *calycina* (given under *Amarella*, but should be transferred to *septentrionalis*, to which it more correctly belongs). Under *septentrionalis* also comes the Shetland var. *multicaulis*.

1765. G. CAMPESTRIS L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Burravoe!; Ronas Voe!; Balta Sound!; Brough of Setter!; Fair Isle?; a curious form, Fetlar, *Beeby*. Spiggie. Laxfirth. Mousa. Hoo Field. Scalloway. Eala Water Burn. Tingwall. Whiteness. Brousta. Ness of Sound. Uyea Sound. Lund. Balta. Burrafirth, etc.

The plant is variable. Much of the Shetland plant is apparently the var. *baltica* (Murb.).

Sub-var. ALBA. Whiteness. Weisdale. Balta. Mousa.

1766. MENYANTHES TRIFOLIATA L. (F.). Abundant, *E. L. & Fl.* Burrafirth, *Tate*. Unst; Mainland, *C. C.* Mailand Burn, Unst:

Scalloway !; Ollaberry, *Beeby*. Cunningsburgh. Spiggie. Lunga. Ponds Water. Lund. Haroldswick. Uyea Sound, etc.

*†1791. SYMPHYTUM TUBEROSUM L. Garden escape, Lerwick, *Mrs Wedgwood*, 1921.

1805. LYCOPSIS ARVENSIS L. (F.). Common, *E. L. & Fl.* Unst; Sand Lodge, *C. C.* Clickhimmin, *Tate*. Quendal Bay; Whiteness; Clousta; Burrafirth, *Beeby*. Cunningsburgh. Lerwick. Norwick, abundant. Balta.

1811. PNEUMARIA MARITIMA Hill (*Mertensia*). (F.). Not common, *E. L.* Sullum Voe; Tangwick; Sand Lodge, *E. Fl.* Bardister Voe, North Maven; Hillswick, *Tate*. Loch End, *C. C.* Skaa, Unst, *Saxby Fl.* Breiwick, 1896; Fetlar; Sandness; Gluss Voe; Aith Voe, *Beeby*. Spiggie Voe, 1921.

1813. MYOSOTIS PALUSTRIS Hill. Frequent, *E. Fl.* [Error.] Unst, *C. C.* Near Uyea, but perhaps from a garden.

Var. STRIGULOSA (Reichb.). (F.). Abundant about Hillwell Loch and thence towards Loch Brue, etc., *Beeby*. Spiggie. Uyea.

1814. M. REPENS Don. (F.). Bressay; Haroldswick !, *Tate*, 1866. Everywhere common. Sandsting; Sand Voe; Grasswater; Tingwall !; Ronas Voe !; Sandwick; Hillswick, *Beeby*. Dunrossness, *Wm. Saxby, jun.* Spiggie. Lerwick. Bressay. Uyea. Watlee.

Forma ALBA. Watlee.

Forma PALLIDA. Haroldswick.

1815. M. CESPITOSA Schultz. Burrafirth; Norwick !, *E. Fl.* Between Ronas Voe and Hillswick !; Clickhimmin Loch !; Scalloway !: Fair Isle, etc., *Beeby*. Ollaberry, *West*. Sumburgh.

The Unst plant often has very pale flowers. In the Orkneys the colour is usually darker than the English plant.

1819. M. SCORPIOIDES L. (*arvensis*). (F.). Common, *E. L. & Fl.* Haroldswick, as *collina*; Buness, *Tate*. Unst; Ollaberry, *West*. Tangwick; Clousta; Scalloway !, *Beeby*. Spiggie Voe. Tingwall. Brousta. Lerwick. Setter. Bressay. Muness. Norwick.

[1820. *M. collina* Hoffm. Abundant, *Tate.* Sought in vain. *Beeby.* Small *arvensis* mistaken for it.]

1821. M. VERSICOLOR Sm. (F.). Shetland, *Tate.* Unst, *C. C.* Loch of Cliff!; Baliasta, *Beeby.* Lund!, *Saxby Fl.* Spiggie. Ness of Sound. Burrafirth. Norwick.

Var. *LUTEA (Pers.). Balta Sound, 1920. Bressay, 1921.

*†1831. VOLVULUS SEPIUM Jung. Alien. (F., as a garden weed.). Balta Sound, 1921.

[1839. *Cuscuta Epithymum* Murr. East side of Loch of Cliff, *Saxby Fl.* Surely an error of identification.]

†1898. MIMULUS GUTTATUS DC. Alien. Clickhimmin Loch, 1886; Brue Loch, Dunrossness, as *M. lutea*, *Beeby.* In the Mailand Burn, 1920.

1907. VERONICA OFFICINALIS L. (F.). Common, *E. Fl.* Unst; Mainland, *C. C.* Ronas Voe; Hoo Field; Björgs of Skelberry; Breiwick; Scalloway; Burn of Sundabanks!; Brousta Loch!, *Beeby Hb.* Tingwall. Laxfirth. Bressay. Ness of Sound. Watlee, etc.

Var. ALLIONII. On Ronas Hill. Larger than preceding, quite glabrous, notch of capsule narrower, *E. Fl.* 16.

Var. RIGIDA E. L. Common on waste ground. Leaves very rigid, not serrated, whole plant glabrous, capsule distinctly winged. See *Journ. Bot.* 301, 1884, where Mr Ridley records a small-flowered form approaching var. *hirsuta* (Hopk.) but with broader leaves. On Hoo Field Mr Beeby found a form with truncate, not notched, capsule, but the preceding year's capsule was normal. See *Scot. Nat.* 36, 1889.

1908. V. CHAMAEDRYS L. Lerwick; Sandwick, *E. Fl.* Needs confirming.

[1909. *V. montana* L. Ollaberry, *E. L.* Error.]

1910. V. SCUTELLATA L. Bressay, 1866, *Tate.* Loch of Lumbister, Yell; Grasswater; Sandwick; Flatpond Loch; Walls; Clousta; Skula Water; Strad of Aithness; Asta Burn; near Burga Water; E. Innes Burn, Yell, *Beeby.* All the glabrous plant.

1911. V. Beccabunga L. (F.). Tingwall !, *E. L. & Fl.* As a minute form, Asta Burn; Flemington; Weisdale, *Beeby Hb.*

1912. V. Anagallis-aquatica L. Brook near Laxfirth, *E. L.* Tingwall !, *E. Fl.* Asta Burn !; ditch at Exnaboe !; Laxfirth; Strand Loch; Flemington, *Beeby.* Dunrossness. Cunningsburgh. Near Virkie. The true *Anagallis.*

1914. V. serpyllifolia L. (F.). Common, *E. Fl.* Unst, *C. C.* Hamna Voe, Walls; Wester Quarffs; Tingwall !; Scalloway !, *Beeby Hb.* Dunrossness, *Wm. Saxby, jun.* Lerwick. Balta.

1919. V. arvensis L. Abundant, *E. Fl.* Scarpoe, Unst; Lerwick !, *Tate.* Seal; Balta !, *Beeby Hb.* Scalloway.

[*V. alpina* L. and *V. fruticans* Jacq. (F.).]

†1923. V. Tournefortii Gmel. Alien. Abundant at Boddam, 1891, *Beeby.* Balta Sound, in garden ground, 1921.

†1924. V. agrestis L. Bressay, *Tate*, 1865. Unst, 1868, *C. C.* Seal; Balta, *Beeby Hb.* Scalloway, 1920.

†1925. V. didyma Ten. Ollaberry, North Maven, *Beeby.* See *Top. Bot. Suppl.*

1926. V. hederifolia L. (F.). Common, *E. Fl.* Seal; Balta !, *Beeby.* Scalloway. Muness, etc.

[*Euphrasia officinalis* L. Everywhere common, *E. Fl.* Var. *exigua* is in all probability *E. micrantha* Reichb. = *gracilis* Fr.]

1932. Euphrasia borealis Wettst. (F.). Ollaberry, *Beeby.* See *Ann. Scot. Nat. Hist.* 233, 1907. Sand Voe; Hillswick: Walls !; Tingwall !; Asta !; North Roe !; Sullum Voe; Springfield, Unst !, *Beeby,* who found it in 1887. If the limitations assigned for this plant by Scandinavian botanists are adopted, it is one of the commonest and most showy of the Shetland Eyebrights. Under it I am, however, convinced there are two or three distinct plants. As an aggregate it is very widely distributed, and in many cases it is a most attractive and abundant plant. Spiggie. Sumburgh. Scalloway. Lee of Setter. Cliva. Ronas Voe. Eala Water Burn. Sandwick. Stroma Loch. Virkie. Cunningsburgh. Lerwick. Bressay. Mousa. Whiteness. Hoo Field. Walls. Tingwall. Asta. Burga Water. Brousta. Balta Isle and Sound. Haroldswick. Norwick. Burrafirth. Gallow Hill. Clibberswick. Uyea. Watlee. Colvadale.

*1933. E. BREVIPILA Burn. & Gremli. Rare. Tingwall, 1920. Norwick. Balta. Saxavord.

1934. E. NEMOROSA H. Mart. Burrafirth; Saxavord; Loch of Cliff; moors about Ollaberry, *Beeby* in *Scot. Nat.* 214, 1888. Grasswater, *Beeby*, 1890, teste *Townsend*. See *Mon.* 26. Uyea Sound. Skaa.

1935. E. CURTA Wetts. (F.). Springfield, Unst; Hamar Voe; Grasswater, *Beeby*. Tingwall. Norwick.

Forma PICCOLA (Towns. in Ann. Scot. Nat. Hist. 177, 1902). Hjogs, Balta Sound, on serpentine at 200 ft., *Beeby*. Scalloway, 1921.

*1936. E. OCCIDENTALIS Wettst. Very rare. Clibberswick, 1921. Messrs Pearsall and Lumb thus name it.

1937. E. LATIFOLIA Pursh = E. ARCTICA Lange. (F.). With white flowers, *West*. Very rare. Scalloway. Balta Sound.

1938. E. FOULAENSIS Towns. (F.). *E. gracilis* Fr., f. *atropurpurea* (Rostr.) Ostenf. = *E. atropurpurea* (Rostr.) Ostenf. in *Bot. Faroes* 55, ? if of Rostr. Banks of Loch of Cliff!, 1888; Burrafirth; Vord Hill, Unst; Foula on Hammarfeld; 1000-1200 ft., Ollaberry; Collafirth; Grasswater; Fitful Head; Hillswick; Mavisgrind!; Queyfirth, *Beeby*.* Locally abundant and widely distributed. Laxfirth. Tingwall. Burga Water. Scalloway, and as a very dwarf form on gravelly soil. Ness of Sound. Lee of Setter. Cliva. Whiteness. Stroma. Eala Water Burn. Bressay. Mousa. Balta Sound and Isle. Colvadale. Burrafirth, etc. Sometimes very dwarfed = forma *nana* mihi, as on the coast at Scalloway and on a hill top near Skail, Orkney.

1938 (2). E. MINIMA Fr. (F.). Saxavord; Fitful Head; Burrafirth; Houllma Water; Uyea; North Maven; Sand Voe, *Beeby.* All determined by Ostenfeld. This includes much, if not all, of the Shetland *scotica* and *foulaensis*, which Ostenfeld considers come under it. I am not convinced about its being true *minima.*

1939. E. MICRANTHA Reichb. *E. gracilis* Fr. *E. officinalis*, var. *exigua*, *E. Fl.* (F.). Collafirth, 1881; Ollaberry, *Beeby.* Balta. Near Sandfield. Haroldswick. Watlee. Muckle Heog. Hill of Hamar.

1940. E. SCOTTICA Wettst. (F.). Frequent, Hamar Voe; Hillswick; Ollaberry; Urafirth Voe; Fair Isle, *Beeby.* Asta. Scalloway. Whiteness. Eala Water. Bressay. Hoo Field. Ronas Voe. Burga Water. Uyea Sound. Watlee. Loch of Cliff. Balta Isle. Saxavord. Hill of Hamar. Mousa. Under this comes a slender, very small, and purplish-flowered plant.

1941. E. ROSTKOVIANA Hayne. Ollaberry, a large-flowered, glabrous form, *Beeby* in *Scot. Nat.* 213, 1888. Burrafirth, 1920. Referred to this species by Mr Lumb. It is an extraordinary plant, 2 in. high, branched, with small leaves and flowers.

Dr Jurgensen, the Norwegian authority on Euphrasias, has commented on the Shetland specimens I had sent him. He says he has had no opportunity of comparing them with the rich material in the Museum at Bergen, but he considers Euphrasias can only be studied well in nature. A few specimens picked out give no reliable result. "Nevertheless," he writes, "I have been glad to see your specimens, which perhaps show that the denomination *E. borealis* and *E. scotica* with you do not agree exactly with my use of them. On the other side, our Scandinavian *E. gracilis* Fries (*E. micrantha* Reichb.) occurs in a typical form in your collection. Your plants queried *E. suecica* are not what we call so in Scandinavia. The Swedish form is very similar to *tenuis*, and may generally only be separated from this species by the want of glands. Your Shetland plant is a form of that species which I have called *E. borealis.* The blunt teeth of the leaves also show it belongs to that species. In Norway we have the same species all along the west coast, and on the other hand we have the nearly related species *E. stricta* here and there in the rest of the country, especially in the south-eastern regions, but there without the early flowering *E. suecica*. The latter form is rare with us, and generally not so well differentiated as in Sweden. On the other hand, in the area of our *borealis* we have, except in the northern part, well differentiated early-flowering forms which I have called × *E. atlantica*. They are very similar to × *E. suecica*, but belong in my opinion to *borealis*, not to *stricta*. These two species seem, however, with us to transgrade into each other by intermediate forms growing more inland, where there is a hotter summer. Your specimens are, however, not my × *atlantica*. As to *foulaensis*, please read my treatise pp. 135, 150, 151, and 240. I have seen different forms from our west coast, which I have referred to that species apparently standing between early flowering forms of *E. micrantha* and *E. borealis*. Also in your material forms occur which seem to connect these two species. However, as *E. borealis* with us has proved to be very variable in regard to the size of the flowers, I have not listed *E. foulaensis* as a separate Norwegian species. This may account for the close alliance between your queried *suecica* and *foulaensis*. *E. scotica* is with us very characteristic, as a little dark-coloured, but pale-flowered species from wet ground on the west coast, forming a connecting link between our *minima* and *micrantha*. Townsend accepted my determination for a great number of specimens. But we have also a larger, greener form, pointing at *borealis*, and that, I think, is nearer to Townsend's type specimens. The small-flowered eglandular form is very striking. . . . In course of time I hope to return to the study of Euphrasias, and shall then try to describe as separate species all those which in nature seem to be distinguishable without regard to Wettstein's [species]. That should also be done with the British Euphrasias.''

1948. Bartsia Odontites Huds. Unst, *Peach*, 1864. East side of Unst, *C. C.*

*Var. littoralis (Reichb.). Virkie. New to Mainland, 1921.

[*B. alpina* L. (F.).]

1949. Pedicularis palustris L. (F.). Frequent. *E. L. & Fl.*

Lerwick, *Tate.* Yell; Mainland, *C. C.* Clousta Water; Bardister!, *Beeby.* Spiggie. Setter. Bressay. Tingwall. Walls. Haroldswick. Virkie.

1950. P. SYLVATICA L. Common, *E. L. & Fl.* Bressay!, *Tate* and *C. C.* Unst; Mainland; Tingwall!; Asta!; Bardister!, *Beeby.* Eala Water. Hoo Field. Mousa. Haroldswick.

1951. RHINANTHUS MAJOR Ehrh. Yell; North Maven, *E. Fl.* Ringasta, 1891, *Beeby.* Balta Sound, new to Unst, 1920.

1952. R. CRISTA-GALLI L., aggregate. (F.). Common, *E. L. & Fl.* Unst; Mainland, *C. C.* Small form on the peat, large form on cliffs north of Saxavord (*groenlandicus*), *Beeby* in *Scot. Nat.* 27, 1887. Brousta; Twart Burn; Hillswick; Clousta Voe; Upper Clubbi, *Beeby.*

Var. *RUSTICULUS (Chab.). Tingwall, 1920. Bressay.

1954. R. STENOPHYLLUS Schur. Cornfield, Balta Sound; Sand Voe; Clousta and by Clousta Voe, 1909; Walls, *Beeby.* Spiggie. Stroma. Ronas Voe.

*1955. R. MONTICOLA Druce. Watlee. Balta. Burrafirth.

*1956. R. BOREALIS Druce. Balta.

1957. R. DRUMMOND-HAYI Druce. (F.). Hillside, Benegarth, North Roe, 1907; Clousta; Voesgarth, *Beeby.* Hoo Field. Balta. Springfield.

1957 (2). R. GROENLANDICUS Chab. Cliffs of Saxavord!; Burga Water. Exactly the plant of the Faroes, *Beeby* in *Ann. Scot. Nat. Hist.* 233, 1907. First British record. Still on the holm in Burga Water from which T. Churchill, who swam across, brought me specimens in both 1920 and 1921.

*1960. MELAMPYRUM PRATENSE L. One specimen in flower on the north-east side of Saxavord at 750 feet, 1921. First record for Zetland. It probably belongs to the var. *montanum* (Johnst.). It had pale yellow flowers and was less than two inches high.

1975. UTRICULARIA VULGARIS L. (F., flowerless.) Scarce. Bressay; Ronas Voe; Scalloway, *E. Fl.* Spiggie; Cloka Burn; Brue Loch, *Beeby*. Probably all these belong to *U. major*.

*1976. U. MAJOR Schmid. Bardister, 1920. Tingwall, 1920. Loch of Cliff, Unst, 1921. Flowerless in all cases.

1977. U. INTERMEDIA Hayne. Pools about Loch Brue; Loch Spiggie (*sic*); pools on the Cloka Burn; Bunya Water, *Beeby*, *l.c.*, 29, 1891. Probably some, if not all these, belong to the next species.

1977 (2). U. OCHROLEUCA Hartm. Loch of Spiggie, *Beeby*, as *intermedia*. Ronas Hill. Walls.

1978. U. MINOR L. Abundant in pools on the Cloka Burn: Bunya Water; Burga Water, *Beeby*, 1891. Unst: Ollaberry, *West*. Aithness (very doubtful); Walls; Punds Loch, *Beeby*. Tingwall Loch, 1920.

1980. PINGUICULA VULGARIS L. (F.). Common. Yell, etc., *E. L. & Fl.* Bressay, *Tate*. Unst: Mainland, *C. C.* Ollaberry: Gluss Burn; Ronas Voe, *Beeby*. Sundabanks. Lee of Setter. Hoo Field. Mousa. Watlee. Lund.

Var. MINOR Koch.? Otterswick, Yell, *Beeby*.

1991. MENTHA SPICATA L. (*viridis*). Alien. Bardister: Ronas Voe, *E. Fl.* Burn of Skaa, Unst, *Beeby*. Still there as a garden escape, 1921, and interesting from the fact of a small patch existing so long.

1994. M. AQUATICA L. (F.). Tingwall!, *Beeby* in *Scot. Nat.* 36, 1889. Spiggie!: Loch Brue; Fair Isle, *Beeby*.

2008. THYMUS SERPYLLUM L. (F.). Common. *E. L. & Fl.* Unst, *C. C.* Keen of Hamar; Collafirth, *Beeby*. Bressay. Mousa. Sandwick. Sumburgh, etc.

Var. PROSTRATA Hornem. (F.). About Ronas Voe; Ollaberry, *Beeby*. Hoo Field.

Var. ALBA. Hoo Field. Spiggie.

[2034. *Nepeta Cataria* L. Alien or probably an error. Sandsting Parish, *E. Fl.*]

[2036. *N. hederacea* Trev. (F.). Sand Voe, *E. Fl.* xiii. I only saw it in gardens. Needs confirming.]

2044. PRUNELLA VULGARIS L. (F.). Common, *E. L. & Fl.* Buness, Unst, *Tate.* Mainland, *C. C.* Balta; Eala Water!; Queyfirth; Twart; Sandwick, *Beeby.* Ollaberry, *West.* Dunrossness, *Wm. Saxby, jun.* Haroldswick. Spiggie. Bressay. Mousa.

[2056. STACHYS SYLVATICA L. Error? North Maven; Lerwick, *E. Fl.* Not seen by Beeby or myself.]

†2056. × S. AMBIGUA Sm. Tingwall, *E. L.* and *Tate.* Bressay, *E. Fl.* Scalloway!, 1888, proves sterile in culture, *Beeby*, 1891. Asta. Lerwick. Burrafirth. Haroldswick. In all cases probably of garden origin. It is a frequent garden plant in the isles.

2057. S. PALUSTRIS L. Common, *E. L. & Fl.* Unst; Ollaberry, *West.* Laxfirth. Burrafirth. Norwick, etc.
*Var. CANESCENS Lange. Loch of Cliff. Norwick.

2062. GALEOPSIS TETRAHIT L. (F.). Very common, *E. L. & Fl.* Unst; Mainland, *C. C.* Bressay, *Tate.* Ollaberry, the form with pale purple flowers, *West.* Baliasta; Scalloway, *Beeby.* Common in the crops and under three distinct modifications.

Var. *BIFIDA (Boenn.). Burrafirth. Norwick. Lerwick. Brousta. Setter. Sumburgh. Sandwick, scarcely typical, but it is the southern *Tetrahit.*

2071. LAMIUM PURPUREUM L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Ollaberry, *West.* Scalloway!; Clousta; Fair Isle, *Beeby.* Bressay. Spiggie. Tingwall. Sandwick. Walls. Norwick. Balta, etc.

2072. L. HYBRIDUM Vill. (F.). Common, *E. Fl.* Lerwick!, *Tate*, 1865.

2073. L. MOLUCCELLIFOLIUM Fr. = L. INTERMEDIUM Fr. (F.). Not common, *E. L.* Tingwall!; North Maven, *E. Fl.* Norwick!;

Skaa!; Unst; Bressay, as *purpureum*, 1865, *Tate*. Scalloway!, *Beeby*. Walls. Spiggie. Cunningsburgh. Ness of Sound. Uyea.

2083. AJUGA REPTANS L. Common, *E. L.* Ollaberry; Ronas Voe; Scalloway, *E. Fl.* Neither Beeby nor I have seen it.

2090. PLANTAGO CORONOPUS L. (F.). Common, *E. L. & Fl.* Bressay, *Tate*. Mousa!; Unst; Mainland, *C. C.* Always with the leaves flat on the ground, Ollaberry, *Beeby*. Spiggie. Balta Isle. Westring. A very variable plant, extremely responsive to conditions of soil and exposure.

Var. PYGMAEA Lange. Hamna Voe, *Beeby*, *l.c.*, 28, 1887.

2091. P. MARITIMA L. (F.). Common, *E. L. & Fl.* At 1476 ft., Ronas Hill!; Muckle Heog!, *Tate*. Plants one inch high on Ronas Hill were thought by West to be var. *lanata* (*sic*). Edmondston recognised the variability of the Sea Plantain and suggested a division into two species:—(1) *P. maritima* proper, with narrow, lanceolate, smooth, erect leaves and cylindric spikes, and (2) *P. setacea*, with leaves cylindric or semi-cylindric, lying flat on the ground and with globular spikes, and under this a var. *lanosa* with the base of the leaf woolly. This latter is common on the serpentine and also on exposed rocky places, especially on the border of coast cliffs. The name may be retained as *P. maritima* L., var. *lanosa* (Edm.), which is in great part the *hirsuta* of Syme. It occurs on the Knabb, Lerwick; Hoo Field; Ronas Hill; Mousa; Lee of Setter; Skaa; Saxavord; Hermaness; Watlee; Colvadale; Clibberswick; Westring, etc.

Forma PROCERIOR Lange. A plant with long, erect, pale green leaves. Burrafirth cliffs, *Beeby* in *Scot. Nat.* 28, 1887.

Var. PYGMAEA Lange. Arisdale Burn, on alluvial grit; Hamna Voe, *Beeby*.

Var. *PUBESCENS mihi. Ordale, Balta. Has the long leaves of the type, but strongly pubescent. The bases are not clothed with silvery white hairs as in *lanosa*.

Var. DENTATA Koch. Bressay, *Tate*. Tingwall Loch side, *Beeby*.

2091. P. EDMONDSTONII Druce in Rep. B.E.C. 41, 1920. Root very long, branching as it nears the soil-surface into many (up to 20) subsidiary stems, each bearing 1-3 scapes. Rootstock above the ground, stout, woody, up to 2½ inches high, bearing crowded, unequally 3-4 nerved leaves, the lamina up to 1½ inches long, lanceolate, rather fleshy, thickly covered with shaggy, white, loosely appressed hairs, especially on the under surface, with a quantity of white tomentum at the leaf-base and on the short petiole. Scape up to 5 inches high, strongly but shortly hairy. Spike ⅜-1 inch long by ¼ inch broad. In several places on the serpentine at Balta Sound as at Springfield, Keen of Hamar. Near Loch Watlee. Clibberswick. This was much larger and had a very conspicuous rootstock, which was covered for some portion of its length with dry leaves of many preceding years. This gave it the appearance of a branch of *Araucaria*, since the crowded leaves were lanceolate, narrowed to a short point, and covered with a silvery pubescence. It had all the appearance of a very distinct species. The variation is, apparently, not due to soil or exposure, since narrow, hairy-leaved plants grew near as well as narrow-leaved glabrous plants except for the white hairs about the rootstock. Two suggestions occurred to one as this wind-swept barren tract of serpentine was traversed. Was this a distinct species crossed with other forms of *P. maritima*. thus giving rise to the great number of intermediate plants, or could it be that *P. lanceolata* entered into its composition and transmitted its pubescence and its broader leaves to the offspring, which have a more pronounced root-stock, fleshier leaves and other strong evidences of *maritima*? In either case the extraordinary variability of the Plantains here might be accounted for. Provisionally, I distinguish this curious plantain by the name of *P. Edmondstonii* in honour of the boy-botanist who discovered *Arenaria norvegica* on the very place where this plantain grows. Further research may prove it to be a hybrid. The plants had no ripe seeds. Several species, however, rarely seed in these northern latitudes. Into this might be merged the broad-leaved forms of var. *hirsuta* Syme and var. *minor* Hooker. Each of the trivials is rejected on account of the confusion arising from their use, and it is by no means ascertained that the Shetland plant is identical with Gilibert's *hirsuta*. The Orkney plant is less pronounced than the Balta Sound specimens, and some may prefer to use the name *minor* for these small plants under *Edmondstonii*. The specimens in our public herbaria give no idea of the latter plant. A second year's observation strengthens my opinion that it is *maritima* × *lanceolata*. Many plants connect it with *maritima*, and some of the more extreme approach *lanceolata*. Indeed, a distinguished Scandinavian botanist was inclined to put them under *lanceolata*.

2092. P. LANCEOLATA L. (F.). Very common. *E. L. & Fl.* Unst; Mainland, *C. C.* Uyea: Clousta; Ollaberry, *Beeby*. Bressay. Mousa. Balta Isle. A very variable species.

Var. DEPRESSA Rostr. Fl. Dan. t. 3008. Sea sands, Sandwick!: Benegarth; Scalloway!, in many places, chiefly in sand but not confined to it, leaves very broad, *Beeby*. Spiggie. Sumburgh. Lund.

Var. CAPITATA Presl. Common about Burrafirth sands and Loch of Cliff; Ollaberry, the common form of rocks and sandy places, *Beeby*. To this may be referred the var. *montana* Edmondst., with leaves scarcely striate; spike globose, few-flowered. In cultivation the characters are not permanent. To it also goes var. *sphaerostachya* Roehl, which seems to be the older name.

Var. ERIOPHYLLA Dcne. Burrafirth!; Ronas Voe, *Beeby*. Springfield. Hagdale. Watlee. Balta.

Var. or forma REPENS (Lange). With a long rhizome, bearing tufts of leaves and flower stems at intervals. Mid Yell Voe. *Beeby* in *Scot. Nat.* 28, 1887.

A monstrous condition was found by Beeby at Sconsburgh, Exnaboe, and Cliva, also a proliferous form at Spiggie in 1907. See *Ann. Scot. Nat. Hist.* 233, 1907.

[2098. *P. media* L. Error. Scalloway, *E. Fl.* This is the var. *depressa* of *lanceolata*.]

2099. P. MAJOR L. Common. *E. L. & Fl.* Unst. *C. C.* Ollaberry, *West*. Bressay, *Tate*. Very common, but often as the following variety.

Var. INTERMEDIA (Gilib.). The usual form of stony loch-sides. Clickhimmin: Tingwall, *Beeby*. Bressay. Mousa. Balta.

2101. LITTORELLA UNIFLORA Asch. Common. *E. L. & Fl.* Clickhimmin!, *Tate*. Unst, *C. C.* Scalloway: Neugles Water, *Beeby*. Watlee. Uyea. Spiggie. Tingwall. Burga.

†2124. CHENOPODIUM ALBUM L. (F.). Abundant, *E. Fl.* Ollaberry, *West.* Spiggie; Levenwick, *Beeby.* Balta. Scalloway.

Var. VIRIDE (L.). East side of Unst, *C. C.*

[2138. *Beta maritima* L. Bressay, *E. Fl.* I could not see it. Probably an error.]

2144. ATRIPLEX PATULA L. (F.). Common, *E. L. & Fl.* Lerwick!; Scalloway!, *Beeby.* A maritime form at Balta Voe, *Beeby* in *Scot. Nat.* 215, 1888. Spiggie. Sandwick. Balta.

Var. ERECTA (Huds.). Scalloway, *Beeby.*

Var. *BRACTEATA Wester. Lerwick!, *Tate*, 1865.

2147. A. HASTATA L. (F.). A common weed at Balta Sound!, 1907; Lerwick!; Fair Isle, *Beeby.* Spiggie. Uyea.

Var. *OPPOSITIFOLIUM Moq. Near Spiggie. Haroldswick.

[2148. *A. deltoidea* Bab. Abundant, *E. Fl.* Var. *prostrata* Bab. Balta Sound, *E. Fl.* Need confirming.]

2149. A. GLABRIUSCULA Edmonst. (F.). Balta Sound, *E. Fl.* Scalloway; Gutcher; Clickhimmin!; Balta!; Urafirth Voe, etc., *Beeby.* Cunningsburgh. Bressay. Mousa.

Forma PARVULA. Swinna Ness, Scalloway, *Beeby.*

Var. BABINGTONII (Woods) Druce. (F.). The *A. rosea* of the *Flora*, where it is described as common on sea shores. Balta Voe!; Gutcher; Scalloway!, *Beeby.* Haroldswick, very young, *Tate.* Spiggie. Bressay. Uyea. Cunningsburgh. Burrafirth.

2150. A. MARITIMA Hall. *A. laciniata* auct. *A. rosea* Woods. [Common on sea shores, *E. Fl.* Error for *Babingtonii.*]. Clayval, Dunrossness, on a sandbank, 1899, *Beeby.*

2158. SALICORNIA EUROPAEA L., aggregate. Frequent, *E. L.* Dales Voe; Balta Sound; Sullum Voe, etc., *E. Fl.* It was too immature in 1921 to decide the segregate.

2166. DONDIA MARITIMA Druce (*Suaeda*). Common, *E. Fl.* Balta Sound!, *Tate.* Haroldswick.

Var. PROCUMBENS (Syme) Druce. Balta Voe!, abundant, *Beeby.*

[2171. *Polygonum Bistorta* L. Broo, Dunrossness, *E. L.* Omitted in *Flora.*]

2172. P. VIVIPARUM L. (F.). Gallow Hill; Uyea Sound, *E. Fl.* Isle of Balta!, *Peach.* Isle of Uyea!, 15 ft.; Ronas Hill, 1476 ft., *Tate.* Sea bank, Lee of Setter; top of Hamar Voe, *Beeby.*

Var. ALPINA Wahl. Lee of Setter, *l.c.*, 216, 1890. With the type but keeping distinct. Root-leaves often orbicular or broadly oblong-oval; bulbils bright golden-yellow, *Beeby.*

[*P. Convolvulus* L. Alien in the Faroes.]

2173. P. AMPHIBIUM L. (F.). Common, *E. Fl.* Lerwick; Unst, *C. C.* Loch of Cliff, *Tate.* Fair Isle, *Straker.* Colvadale, *Beeby.* Spiggie. Hoo Field. Abundant at Norwick, forming a large part of the vegetation in a hay field, as the so-called var. *terrestre* Leers.

2175. P. PERSICARIA L. Frequent, *E. L. & Fl.* Tingwall Loch; Easter Quarff; a handsome cornfield plant at Aith Voe; Levenwick; Lerwick, *Beeby.* Rare.

[2177. *P. Hydropiper* L. Frequent, *E. Fl.* Not seen by Beeby or myself.]

[2182. *P. Raii* Bab. Common, *E. Fl.* Burrafirth, *C. C.* Needs confirmation.]

2184. P. AVICULARE L., aggregate. (F.). Frequent, *E. L. & Fl.* Unst, *C. C.* The segregate, *P. heterophyllum* Lindm. is the common form. It is in *Beeby Hb.* from Clousta; Aith Voe; Scalloway; Sandwick; Brousta Voe. I saw it at Bressay, Mousa, Balta Isle, Lerwick, Scalloway, Walls, Haroldswick, Ronas Voe, Spiggie, Uyea Sound, etc. Beeby records var. *agrestinum* (Jord.) from Scalloway, Tingwall, and Cunningsburgh.

Var. LITORALE Koch = MARINUM S. F. Gray. Bressay; Norwick, *Tate.* Cunningsburgh, *Beeby.* Uyea Sound, as forma **grandiflora*, a robust plant.

*2184 (2). P. AEQUALE Lindm. Scalloway, 1920. Haroldswick. Uyea Sound, with rose-coloured flowers.

[*Koenigia islandica*. (F.).]

2194. Oxyria digyna Hill. (F.). South side of Ronas Voe!, abundant over a restricted area, from sea level to 30 ft., 1890. *Beeby*.

2196. Rumex longifolius DC. *R. domesticus*. (F.). Very common, *E. Fl.* Unst; Mainland, *C. C.* Abundant, Ollaberry, *Tate*, 1865. Tingwall; Scalloway; Ronas Voe!; Baliasta; Balta!, *Beeby*. Walls. Bressay. Mousa. Sumburgh.

× R. conspersus Hartm. (F.). Baliasta; Balta Sound!; Asta Voe, *Beeby* in *Scot. Nat.* 29, 1891. Walls. Bressay.

2198. R. crispus L. (F.). Common, *E. L. & Fl.* Buness. Unst, *Tate*. Balta. Tingwall. Scalloway. Walls. Bressay. Mousa.

× R. propinquus Aresch. = crispus × longifolius. Scalloway, *l.c.*, 300, 1890; Balta; Tingwall, 1891, *Beeby*.

× R. acutus L. = crispus × obtusifolius. Upper end of Tingwall Loch, *Beeby* in *Scot. Nat.* 29, 1891. Edmondston says it is common, but his plant is doubtless a *longifolius* hybrid.

2200. R. obtusifolius L. (F.). Unst; Ollaberry, *Tate*, 1866. Unst, *C. C.* Baliasta; Scalloway, *Beeby*. Bressay.

2209. R. Acetosa L. (F.). Very common, *E. L. & Fl.* Lerwick, *Tate*. Unst, *C. C.* A dwarf form, 1-2 in. high, on the top of Saxavord, *Beeby*. Bressay. Mousa. Balta Isle.

2210. R. Acetosella L. (F.). Very common, *E. L. & Fl.* Lerwick, *Tate*, 1865. Yell; Clousta; Ronas Voe, *Beeby*. Bressay. Mousa.

Var. angiocarpus Murb. Clousta, *Beeby*.

Var. Acetoselloides (Bal.). Sand Voe; Clousta; Chamerwick, Dunrossness; Burrafirth!, *Beeby*. Huesbreek.

†2225. Euphorbia Helioscopia L. Alien. Common, *E. L. & Fl.* Unst, *C. C.* Tingwall, *Beeby*. Laxfirth. Scalloway.

†2235. E. Peplus L. Alien. Boddam, abundant as a garden weed, 1891, *Beeby*. Scalloway, 1920.

2250. URTICA DIOICA L. (F.). Very common, *E. L. & Fl.* Scalloway; Browland Voe, *Beeby*. Bressay. Mousa. Balta Isle. The inflorescence is often very dark purplish-brown.

2251. U. URENS L. (F.). Frequent, *E. Fl.* Unst; Lerwick, *C. C.* Ollaberry, *West.* Scalloway!, *Beeby.* Spiggie. Sandwick Mines. Norwick.

2255. BETULA ALBA L. Unst, *Edmondston*, 1841. See also *New Stat. Acc.* 1841. Not seen by me. Beeby has had remains of it from the peat.

†2258. ALNUS GLUTINOSA Gaertn. Alien. As "Elder" in the mountains of Shetland, *Gordon Stat. Acc.* 1794. Planted, Lerwick, *C. C.* By the inn at Tresta, *Beeby.* Only as a planted tree.

2260. CORYLUS AVELLANA L. Hazels . . . are found in the mountains, *Gordon, l.c.*, 1794. In many of the islets . . . in the lochs, *Bryden New Stat. Acc.* 1841. Nuts are found in the peat. Now extinct?

†2268. SALIX FRAGILIS L. Alien. Loch End, *Beeby*, planted.

†2273. S. STIPULARIS Sm. Alien. Shetlands, *W. R. Linton*, but if so, planted.

†2274. S. SMITHIANA Willd. Alien. Planted in a croft at Loch End, *Beeby.*

2275. S. CAPREA L. Holm in Mousa Vord Loch, 1907, *Beeby.* Somewhat doubtful. Linton thought it was *Caprea × cinerea*: Ostenfeld, *cinerea.*

2276. S. AURITA L. Plentiful, *E. L. & Fl.* Loch of Cliff!; Hamar Voe: Burga Water: Eala Water!: Gluss Burn: Tingwall!; Lee of Setter!; Ollaberry, *Beeby.* (Tate's Burrafirth *cinerea* is *aurita*). Queyhouse Loch.

× S. AMBIGUA Ehrh. Between Burrafirth and Loch of Cliff! *Scot. Nat.* 28, 1887: slopes above Sand Voe: Eala Water!, *Beeby.*

2277. S. CINEREA L. (*aquatica*. E. L. & Fl.). [Near Bardister.

North Maven, *E. Fl.* Error.]. Unst, *C. C.* Abundant, Muckle Mill, Loch of Uyea, 1909, *Beeby*.

2278. S. REPENS L. Common, *E. L. & Fl.* Mousa; Ollaberry, *Tate.* Unst, *C. C.* Wick of Hagdale!; Hamar Voe; Eala Water!; Hillswick; Setter Voe; Clousta; Saltness; Walls, *Beeby.* Dunrossness, *Wm. Saxby, jun.* Bressay. Mousa, plentiful. Watlee.

Var. INCUBACEA (Sm.). Mousa, *Dr M'Nab* in *E. Fl.*

Var. ARGENTEA (Sm.). Uyea; North Maven, *E. Fl.* Ollaberry, *Tate.*

Var. *PARVIFOLIA Sm. Watlee.

2285. S. HERBACEA L. (F.). Ronas Hill, 1841, *E. L.* Fair Isle, 700 ft.; Saxavord!, 938 ft., *Tate*, 1866. Foula, common; Goafirth Loch, Delting; Björgs of Uyea; Dall of Lumbister, *Beeby.*

[*Salix glauca* and *phylicifolia* are recorded for the Faroes.]

2290. POPULUS TREMULA L. Ronas Voe, near Feal!, *Beeby.*

[2291. *P. nigra* L. Scalloway; Walls; Busta; Cunningsburgh, *E. Fl.* An error for *tremula*, or planted.]

2295. EMPETRUM NIGRUM L. (F.). Common, *E. L. & Fl.* Common in Unst; Ronas Hill!, from sea level to 938 ft., *Tate.* Hoo Field!; Cunningsburgh; Ollaberry; Foula, *Beeby.* Sea level at Laxfirth. Burga Water. Scalloway. Lee of Setter. Watlee Loch side. Skaa.

[2301. *Malaxis paludosa* Sm. (F.).]

2306. LISTERA CORDATA Br. (F.). Scatsta; hills above Lerwick; Ronas Hill, *Tate*, 1866. West side of Vallafield, Unst, *Saxby Fl.*

[2325. ORCHIS LATIFOLIA L. (F.). Frequent, *E. L. & Fl.* Balta Sound, *C. C.* Loch of Cliff; Queyfirth; near Ollaberry; Collafirth; Foula, *Beeby.* This seems made up of two or more species and is only an aggregate name. I have not seen any plant which I should call *latifolia* from the Shetlands.]

2326. O. INCARNATA L. This alone is given for Shetland by Trail in *Ann. Scot. Nat. Hist.* 230, 1906. Some of the foregoing belong here.

*2326. O. PRAETERMISSA Druce. Spiggie. Noss, W. H. St Quintin. Var. *PULCHELLA Druce. Loch of Cliff. Balta Sound. Burrafirth. Whiteness. Tingwall, 1920. Spiggie. Laxfirth. Walls. Brousta. Ness of Sound. Setter. Hoo Field. Haroldswick. Colvadale. This is Tate's *O. mascula* from Bressay, 1865.

* × MACULATA (*latifolia* auct., p.p.). Spiggie. Laxfirth. Whiteness. Dunrossness. Cunningsburgh. Burrafirth.

*2326 (3). O. PURPURELLA Steph. Bressay. Balta.

2327. O. MACULATA L., vera. (F.). Frequent, *E. L. & Fl.* Balta, *C. C.* Ronas Hill; Skelberry; Fair Isle, probably, *Beeby.* Bressay, *Tate.* Scalloway. Bressay. Mousa. Haroldswick. Norwick. Watlee. Hoo Field. Gallow Hill.

Var. *MACROGLOSSA Druce. Brindister. Ness of Sound. Bressay. Haroldswick. Gallow Hill.

2329. O. MASCULA L. (F.). Frequent, *E. L. & Fl.* Balta. *Straker.* Tate's specimen is *O. praetermissa*, var. *pulchella.*

2338. HABENARIA GYMNADENIA Druce (*G. conopea*). North Roe. North Maven, *E. Fl.* Unst, rare, *West* and *Beeby.* Small specimens, with dark coloured flowers, at Balta Sound, 1920-21. Skaa. Clibberswick.

[2339. *H. albida* Br. (F.). Bressay, *E. Fl.* Needs confirmation.]

2340. H. VIRIDIS Br. (*Coeloglossum*). (F.). Common, *E. L.* Tingwall!; Fetlar, *E. Fl.* Balta Sound!, *C. C.* Hillswick. Hamar Voe. North Maven. Voesgarth. Ness of Sound. Gallow Hill. Mousa, etc.

Var. *OVATA Druce. Balta Sound, on the serpentine. Watlee. Clibberswick. Hoo Field. Mousa. This is Tate's *viridis* from Muckle Heog.

2349. IRIS PSEUDACORUS L. (F.). Common, *E. L. & Fl.* Haroldswick, Unst, *Tate.* Lerwick, *C. C.* The prevailing form is *acoriformis*, *Beeby*, *l.c.*, 235, 1907. Colvadale; Hamar Voe; Tingwall; Fair Isle, *Beeby.* Spiggie. Bressay. Mousa.

2408. SCILLA VERNA L. (F.). Shetland, *Neill.* Very common, *E. L. & Fl.* Unst!; Lerwick; Ronas Hill, *C. C* Ollaberry; Hillswick; Fair Isle, *Beeby.* Balta Sound. Whiteness. Spiggie. Laxfirth. Brousta. Hoo Field. Mousa, two specimens in flower in August 1921.

†2411. S. NON-SCRIPTA H. & L. Alien. Waste ground, Balta Sound, *E. Fl.* Garden outcast!, *Tate.*

*†2415. LILIUM PYRENAICUM Gouan. Alien. Near Cliff, by a stream, doubtless washed down from a garden.

2423. NARTHECIUM OSSIFRAGUM Huds. (F.). Abundant, *E. L. & Fl.* Unst; Yell; Mainland, *C. C.* Tingwall, *Tate.* Scalloway; Clousta; Balta Sound, *Beeby.* Spiggie. Bressay. Mousa. Lund. Uyea.

[*Tofieldia palustris* Huds. (F.).]

2428. JUNCUS CONGLOMERATUS L. (F.). Very common, *E. Fl.* Unst, *C. C.* Ollaberry; Clickhimmin; Clousta; Roerwater, scarce, *Beeby.* Very scarce, *Saxby Fl.* Bressay. Mousa.

2429. J. EFFUSUS L. (F.). Common, *E. L. & Fl.* Ronas Voe; Collafirth; Valladale; Slovabreck; Hillswick, *Beeby.* Burrafirth. Haroldswick. Uyea. Lee of Setter. Spiggie, etc.

Var. *SPIRALIS M'Nab. Ronas Voe, 1920. Cunningsburgh. Mousa. Loch of Cliff. Haroldswick.

[2430. *J. inflexus* L. (*glaucus*). Lerwick, *West.* Requires confirmation.]

2434. J. SILVATICUS Reich. Abundant, *E. Fl.* Not seen by Beeby. Ollaberry; Unst, in some places very dwarfed, *West.*

[*J. subnodulosus*, *J. balticus*, and *J. biglumis* are recorded from the Faroes.]

2435. J. ARTICULATUS L. (*lamprocarpus*). (F.). Pools and ditches, *E. Fl.* Common, Hamna Voe; Uyea; North Maven; Tingwall; Colvadale; Fair Isle, *Beeby*. Bressay. Mousa. Watlee. Hoo Field. Asta, etc.

2437. J. BULBOSUS L. (*supinus*). (F.). As *J. uliginosus*, abundant, *E. L. & Fl.* Unst, *C. C.* Voesgarth Hill!; Scalloway; Fair Isle; Queyhouse Loch, *Beeby*. Lund. Burrafirth. Eala Water. Spiggie, etc.

Var. KOCHII (F. S.) Druce. Slopes of Saxavord, *W. R. Linton*. Near Haroldswick. Bressay. Mousa.

Forma SUBMERSA. Asta. Watlee.

2438. J. SQUARROSUS L. (F.). Very common, *E. L. & Fl.* Skaa, *Tate*. Lerwick, *C. C.* Hermaness; Hillswick, *Beeby*. Top of Saxavord. Bressay. Mousa. Balta Isle.

[2439. *J. compressus* L. *E. L. & Fl.* An error for *Gerardi*.]

2440. J. GERARDI Lois. (*coenosus*). Salt marshes, *E. Fl.* The *J. compressus* is an error for this species. Ollaberry, *Tate*. Whiteness Voe; Uyea Sound; Queyfirth!; Hamna Voe; Clousta Voe, *Beeby*. Spiggie. Laxfirth. Bressay. Lund.

Var. *GRACILIS Druce. A very slender form, near Lerwick. 1920.

2442. J. BUFONIUS L. (F.). Common, *E. Fl.* Ollaberry, *West*. Unst, *C. C.* Sand Voe; Ronas Voe!; Lerwick; Hildasay; Loch of Cliff, *Beeby*. Bressay. Mousa. Balta Sound, etc.

2446. J. TRIGLUMIS L. (F.). Ronas Hill, *E. L. & Fl.* Colvadale, abundant, at 200-300 ft., 1888, *Beeby*.

2448. J. TRIFIDUS L. (F.). Ronas Hill, 1868, *C. C.* [The *trifidus* of Edmondston's *List* is an error.]

2449. JUNCOIDES SYLVATICUM (Huds.) = LUZULA. (F.). Frequent, Ronas Hill; Scalloway; Vallafield; Hermaness, etc., *E. Fl.* Saxavord!, *Tate.* Sundabanks!, *C. C.* Burga Water!; Loch of Cliff, *Beeby.* Eala Water. Hoo Field. Ronas Voe. Petister. Skaa.

Var. GRACILE (Rostr.). (F.). Upper slopes of Saxavord!, flowering on the small plateau; Hermaness, profusely, but barren; Fitful Head, 1890; Hammerfield, 1100 ft., Sneug, 1400 ft., Foula, flowering, *Beeby.*

2452. J. PILOSUM Morong. (F.). North Roe; Fedaland, *E. Fl.* Eala Water; Breiwick; Scalloway; Vaila Isle; Lerwick; Skelberry; Foula, *Beeby.* Burga Water.

2454. J. MULTIFLORUM Druce. Ronas Voe, 1886, *Beeby.* Tingwall; Unst; Ollaberry, *West.* Bressay. Watlee. Saxavord.

Var. CONGESTUM Druce. Hermaness, *C. C.* Hillswick; Upper Clubbi; Collafirth, *Beeby.* Bressay. Mousa. Lund. Haroldswick.

2456. J. CAMPESTRE Morong. (F.). Common, *E. L.* Bressay; Haroldswick; Unst, *Tate.* Everywhere common. Queyfirth; Ollaberry; Cliff, *Beeby.* Hoo Field. Bressay. Mousa. Balta.

2458. J. SPICATUM (L.) Druce. (F.). Ronas Hill, 1868, *C. C.*

[*J. arcuatum* occurs in the Faroes.]

[2463. *Sparganium ramosum* Huds. Lerwick, *C. C.*, 1868. Requires confirmation.]

2464. S. SIMPLEX Huds. Common, *E. L.* Tingwall, *E. Fl.* xii.
Var. LONGISSIMUM Fries. Burn of Burrafirth, *Beeby*, 1886.
× NATANS. Burn of Burrafirth, *Beeby*, 1889.

2465. S. NATANS L. (*affine*). (F.). Abundant, *E. L.* Tingwall; Loch of Cliff, *Tate*, 1866. The common species, Burn of Burrafirth!; Ustaness Loch; Scalloway; Housesetter; Mailand Burn!, *Beeby.* Brousta, 1920.

Var. ZOSTERIFOLIUM (Neum.). Mailand Burn!, *Beeby.* See *Scot. Bot. Rev.* 94, 1912. Watlee Burn.

2466. S. MINIMUM Fr. Tingwall, *E. Fl.* Mailand Burn, *Beeby* in *Scot. Nat.* 37, 1889. Grasswater Loch, Walls, *Beeby*. Henry's Loch.

2482. TRIGLOCHIN MARITIMUM L. Frequent. *E. Fl.* In a small bog by the Kergova Burn at 110 ft. and 2½ miles from sea, 1909, *Beeby*. Uyea Sound. Bressay.

2483. T. PALUSTRE L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Ollaberry; Clousta Voe; Walls; Scalloway, *Beeby*. Spiggie. Lund. Sumburgh.

2485. POTAMOGETON NATANS L. (F.). Common, *E. L. & Fl.* Loch of Cliff!, *Tate*. Ronas Voe!; Asta!; Uyea!; Ollaberry, *Beeby*. Tingwall. Henry's Loch. Watlee.

2486. P. POLYGONIFOLIUS Pourr. (F.). Bressay, 1865, in *Hb. Druce*; Skaa; Unst!, *Tate*. Deep water form between Eala Water and Collafirth!; narrow leaved state, Hillswick; Scalloway!; Laxdale; Culswick; Hillswick; Sandsting; Ollaberry; Neugles Water, *Beeby*. Ponds Water. Watlee. Uyea Sound. Haroldswick.

Var. CANCELLATUS Fryer. In the burn from Brousta Water, *Beeby*, *l.c.*, 29, 1891. Thought by him to be *polygonifolius* × *heterophyllus*. It produces scarcely any floating leaves. It grows chiefly in a sort of backwater where the water eddies a little but is tolerably still. The less coriaceous floating leaves in their veining recall *coloratus*. In very small quantity in 1920 and 1921, but sufficient to dispel any suggestion of hybridisation. In this Dr Hagström agrees.

The heath form (*ericetorum* Syme) is a common plant.

[2489. *P. alpinus* Balb. (F.). ? × *P. gracilis* Wolfg. Recorded as *P. Wolfgangii* Kihlm. by Beeby in *Scot. Nat.* 217, 1890, from the Loch of Lumbister, Yell. A supposed hybrid with *gramineus*, of which it may be a form, but further gatherings are necessary to establish the above determination.]

2493. P. GRAMINEUS L. (*heterophyllus*). (F.). Burrafirth!; Vallafield, *E. Fl.* Tingwall!, *Tate*. Clickhimmin!; between Ustaness and Scalloway; Neugles Water; Grasswater; Sandsting; Walls!, *Beeby*.

Var. *LACUSTRIS Fr. Tingwall, 1920.

2495. × P. NITENS Web. (F.). Brousta; Spiggie!; Tingwall!; Asta Burn; Neugles Water; Scalloway, *Beeby*. Bardister Loch, 1920.

Var. CURVIFOLIUS Hartm. North end of Loch of Cliff; Tingwall, *Beeby*. Probably the *lanceolatus* of Edmondston.

[2498. *P. lucens* L. Loch of Cliff; North Roe, *E. Fl.* Error.]

2501. P. PRAELONGUS Wulf. (F.). Loch of Watlee!; Tingwall!; Burga Water; Kirkiegarth, *Beeby*. Bardister. Tingwall, 1920. Loch of Huesbreek. Asta Loch.

2502. P. PERFOLIATUS L. (F.). Scalloway; Norwick; Loch of Cliff!; near Burravoe; Tingwall!, *Beeby*. Bardister. Watlee.

Var. LANCEOLATUS Blytt. West Loch, Hildasay, 1889, *Beeby*. Tingwall. Loch of Cliff.

[2503. *P. crispus* L. Tingwall; Loch of Cliff, *E. Fl.* Error.]

2508. P. PUSILLUS L. (F.). Clickhimmin Loch, immature; pools on the Cloka Burn, *Beeby*. Bardister Loch. Asta Loch, 1920.

[Var. *rigidus* Bennett. Bardister Loch, plentiful, *Beeby*, *l.c.*, 30, 1891. Said to be the same as the Orkney plant, but it is smaller with shorter leaves. This requires confirmation, as it may be one of the two next species.]

*2508. P. PANORMITANUS Biv. Tingwall, 1920. Asta, 1921.

*2509. P. RUTILUS Wolfg. Tingwall Loch. Bardister Loch, 1920. This removes the query in *British Pondweeds* for its occurrence in the Shetlands.

2512. P. PECTINATUS L. Brackish pools, Dales Voe; Balta Sound, *E. Fl.*, but needs confirmation. Asta; Tingwall; Spiggie, *Beeby*.

[2512 (2). *P. vaginatus* Turc. *P. pectinatus*, var. *fluviatilis*

S. & M. Tingwall and Asta Lochs, teste Bennett, and probably this in Spiggie Loch, *Beeby*, *l.c.*, 235, 1907. These are not the true *vaginatus*, which at present is not known to grow in Britain, but the hybrid described in the next paragraph.]

*2512. × P. SUECICUS R., var. INTERMEDIUS, nova forma PECTINATOIDES Hagström = P. PECTINATUS × FILIFORMIS. Tingwall Loch. Asta Loch, 1920. Loch of Spiggie, 1921. These are identical with Beeby's so-called *vaginatus*, and Dr Hagström has thus definitely identified them.

[*P. lanceolatus* Edmondst. Burrafirth. It is an error.]

2513. P. FILIFORMIS Pers. (*marinus* L.). (F.). Uyea Sound!; Kirk Loch; Ness Loch, Yell. *Tate*, 1866. Balta Sound; Scalloway; Asta!, *Beeby*. Tingwall and Asta Lochs, 1920. Loch of Spiggie. Loch of Huesbreek, abundant. Watlee, 1921.

2515. RUPPIA MARITIMA L. (*spiralis*). Moss Bank; Dales Voe; Busta, *E. Fl.* Dale Burn; Haggrister Bight; Sullum Voe; Fugla Ness, *Beeby*.

2516. R. ROSTELLATA Koch. (F.). Hoove; upper end of Whiteness Voe, 1889; Uyea Sound; Unst!, *Beeby*. Plentiful in the sea loch there.

2519. ZANNICHELLIA POLYCARPA Nolte. Loch of Watlee, Unst, 1888; Bardister, 1891. *Beeby*.

2520. ZOSTERA MARINA L. (F.). Common. *E. Fl.* Balta Sound, *C. C.*

Var. ANGUSTIFOLIA Hornem. The only form seen. Whiteness; Balta. *Beeby*.

2529. ELEOCHARIS PALUSTRIS Br. (F.). Common, *E. L. & Fl.* Burrafirth, *Tate*. Ollaberry, *West*. Punds Loch!, *Beeby*. Spiggie. Dunrossness. Bardister. Eala Water. Bressay. Balta Isle. Lund.

2529 (2). E. UNIGLUMIS Schultes. (F.). Loch of Cliff!; Queyfirth; Burrafirth!; Breiwick; Scalloway; Uyea; Hildasay, *Beeby*.

2530. E. MULTICAULIS Br. (F.). Bogs on hills between Burga Water and Snarraness Voe; Tingon Burn; Clousta, 1891; Punds Loch !, *Beeby*.

[2531. *E. acicularis* Br. Ronas Hill, 1868; Unst, *C. C.* Queyhouse Loch, 1886, *Beeby*, but Beeby's specimen proved to be a submerged form of *Juncus bulbosus*. Needs confirmation.]

2534. SCIRPUS LACUSTRIS L. Loch of Lund !, *E. Fl.* Sandwater Loch, *P. W. White* in *Tudor's Orkney and Shetland*, 1883. Grasswater; Bridge of Walls, *Beeby*. The Lund plant was very small in 1921.

2538. S. CAESPITOSUS L. (F.). Very common, *E. L. & Fl.* Bressay, *Tate*. Colvadale; Ronas Voe; Walls, *Beeby*. Ollaberry, *West*. Mousa. Hoo Field.

Var. *GERMANICUS (Pallas). (F.). It is the common, if not the only, form. Saxavord. Hermaness. Ronas Hill. Mousa.

2539. S. PAUCIFLORUS Lightf. (F.). Rather common in Unst !; Hillswick; Ollaberry; Asta !; Hillswick, common, *Beeby*. Eala Water Burn. Hoo Field. Colvadale. Gallow Hill.

2542. S. SETACEUS L. Between Sundabanks and Wester Quarff; near the sea at Burwick; Scalloway, 1889, *Beeby*.

2544. S. FLUITANS L. Cloka Burn, a mile above Walls; Burga Water !; burn running from Houllma Water to Grasswater !, *Beeby*, 1891.

2546. S. RUFUS Schrad. Scarce. Dales Voe; Bressay; Burrafirth; Yell, *E. Fl.* Whiteness Voe; Clousta; Sullum Voe, *Beeby*. Balta Sound, 1920.

[2547. *Eriophorum paniculatum* Druce = *latifolium* and *E. polystachion*. Very common, *E. Fl.* Unst, *C. C.* These doubtless refer to the next species.]

2548. E. ANGUSTIFOLIUM Roth. (F.). Abundant, *E. L. & Fl.* West Quarff; Colvadale !, *Beeby*. Ollaberry, *West*. Spiggie. Bressay. Mousa.

Var. LONGIFOLIUM Hoppe. Bog by Twart, *Beeby*.

2550. E. VAGINATUM L. (F.). Common, *E. L. & Fl.* Bressay, *Tate.* Mousa Voe, *Beeby.* Ollaberry, *West.* Saxavord. Hermaness. Setter, etc.

[2553. *Rynchospora alba* Vahl. Mousa, Unst, *E. L.* Vaila Island, *E. Fl.* Doubtful, *Beeby.* Needs confirmation. The *R. fusca* of *Saxby's Flora*, 90, is an error for *Scirpus rufus.*]

2554. SCHOENUS NIGRICANS L. Not unfrequent in Unst on serpentine, *E. L. & Fl.* Scarpoe, Unst; Isle of Uyea, *Tate.* Eala Water. Colvadale. Tingwall.

Var. NANUS Lange. Balta Sound!, *Beeby.* Hoo Field. Colvadale.

2561. CAREX VESICARIA L. Abundant near Grasswater; near Bridge of Walls!, *Beeby*, 1907. Houllma Water, 1920.

[*C. saxatilis* L. (F.).]

2564. C. INFLATA Huds. (*ampullacea*). Frequent, *E. L. & Fl.* An androgynous form in the Mailand Burn!; Queyfirth; Ollaberry; Burga Water, *Beeby.* Near Punds Water. Mangaster. Loch of Lund. Queyhouse. Uyea Sound. Loch of Lund, etc.

Var. *BRUNNESCENS (And.). Haroldswick. Loch of Watlee.

[2571. *C. capillaris* L. Ronas Hill, *E. Fl.* Needs confirmation.]

2572. C. BINERVIS Sm. (F.). Frequent!, *E. L.* Hermaness; Uyea; North Maven, *E. Fl.* Ronas Hill, *C. C.* Hermaness!, *Tate.* Skelberry; Clousta; Eala Water; Boer Water Loch; Dall of Lumbister, Yell; Uyea; North Maven; Fair Isle; a small form on Saxavord; a remarkable dwarf form (f. *gracilior*) on Ronas Voe and Saxavord, *Beeby.* Hoo Field. Sundabanks. Colvadale, etc. A very tall, lax form on Ronas Voe, 1920.

Var. NIGRESCENS Druce. Near this at Neugles Water Burn, *Beeby.* See *Scot. Nat.* 38, 1889.

[2573. *C. distans* L. Tate suggests this is Edmondston's *speirostachya*, but that is probably a *fulva* form. Beeby and I were unable to find *distans.*]

2575. C. FULVA Host. (*speirostachya*). (F.). Common, *E. Fl.* Ollaberry; Colvadale!, *Beeby*. Balta Sound. Watlee. Burrafirth. Uyea. Mousa. Hoo Field. Setter. Eala Water, etc.

2576. C. FLAVA L., aggregate. (F.). Common, *E. Fl.* The type in a ditch running into the north end of the Loch, Tingwall, *Beeby*, 1889.

Var. OEDOCARPA Anders. (*minor*). Ronas Hill, 1868, *C. C.* Ollaberry; Weisdale; Boddam; Ronas; Balta!; Fair Isle, *Beeby*. Laxfirth. Hoo Field. Walls. Bressay. Burga Water. Mousa. Watlee. Colvadale. Burrafirth.

× C. XANTHOCARPA Déség. (F.). Colvadale!; Benegarth; North Maven; Gibbies Law, *Beeby*. Mousa. Tingwall. Watlee. This includes hybrids of *C. fulva* with forms of *C. flava* and *lepidocarpa*.

2576 (2). C. LEPIDOCARPA Tausch. Ronas Hill, 1868, *C. C.* Ollaberry; Weisdale, *Beeby*. Mousa. Watlee. Haroldswick. A suggested hybrid of this with *C. flava* was seen at Gibbies Law by Beeby.

2577. C. OEDERI Retz. Frequent, *E. Fl.* Stony loch shore above Burwick, near Scalloway (near var. *pygmaea* And.); Tingwall!; Sae Water; Torve Hill, *Beeby*.

C. FLAVA, var. OEDOCARPA × OEDERI. Sae Water; Torve Hill, 200 ft., *Beeby*.

[2583. *C. caryophyllea* Lat. (*praecox*). Common, *E. Fl.* Error. Not seen by Beeby or myself. Doubtless the next species was mistaken for it.]

2587. C. PILULIFERA L. (F.). Scarpoe, Unst; Isle of Uyea!. *Tate*, 1866. Rather common, Saxavord!; Ronas!; Skelberry, *Beeby*. Balta Sound, 1920. Scalloway. Hoo Field. Mousa. Colvadale. Gallow Hill, etc.

Forma REPTANS Lange. Grass slopes above Burrafirth, *Beeby*.

2588. C. DIVERSICOLOR Crantz = GLAUCA = RECURVA. (F.). Abundant!, *E. L. & Fl.* Burrafirth; Colvadale; Balta; Fair Isle. *Beeby.* Mousa. Bressay, etc. A suggested hybrid—*glauca* × *flava* —occurred on a holm on a small tarn in Gibbies Law Burn, but no other sedge grows on the holm, *Beeby.* A very stout-spiked form grew on Balta Sound, and a strongly rhizomatous form on Colvadale.

2591. C. PANICEA L. (F.). Out Skerries, *Peach.* Lerwick!; Bressay!; Unst!, *Tate.* Ronas!, *C. C.* Colvadale; Balta. *Beeby.* Hoo Field. Eala Water. Haroldswick. Watlee.

[*C. cespitosa* L. West side of Loch of Cliff, *Beeby* in *Scot. Nat.* 217, 1888, but it is not the true plant, being one of the many forms of *Goodenowii.*]

[*C. salina* Wahl. (F.).]

2604. C. GOODENOWII Gay (*vulgaris*). (F.). Common, *E. Fl.* Hillswick; Ronas Voe!; Clickhimmin!; Rouls Water; Gibbies Law!; Bonzie Hill!; Lumbister; Yell; Loch of Cliff (as *cespitosa*); Queyfirth; Fair Isle, *Beeby.* Bressay. Mousa. Spiggie. Lee of Setter, etc.

Var. RECTA A. & G. Loch of Cliff!, *Beeby.* Haroldswick. Tingwall.

Var. JUNCELLA (Fries). Loch of Cliff!, common, *Beeby.* Watlee. Lund. Walls. Beeby thought the Clickhimmin plant was a cross with *acuta.* It seems only a variety of the type.

[*C. Goodenowii* × *flava*, *C. Goodenowii* × *rigida*, *C. atrata*, and *C. Lyngbyi* are reported from the Faroes.]

2606. C. RIGIDA Good. (F.). Ronas Hill; Saxavord!, *E. Fl.* On a holm in Gibbies Law Burn, under 100 feet, a curious lowland form. See *Scot. Nat.* 30, 1891; Foula; Skelberry, *Beeby.*

2608. C. LEPORINA L. (*ovalis* Good.). (F.). Balta Sound!; North Roe!, *E. Fl.* Burra Voe, *West.* Yell; Uyea Sound!; Tingwall!, *Tate.* Scalloway. Bressay. Mousa. Loch of Cliff. Norwick.

2610. C. ECHINATA Murr. (*stellulata*). (F.). Frequent !, *Tate*. Ronas Hill, *C. C.* Ollaberry, *West*. Asta ! ; Scalloway ! ; Hermaness ! ; Fair Isle, *Beeby*. Spiggie. Hoo Field. Mousa. Bressay. Balta Sound, etc.

2621. C. ARENARIA L. Burrafirth ! ; Tresta, Fetlar. etc., *E. Fl.* Unst !, *C. C.* Sandwick. Spiggie. Sumburgh. Sandness.

2625. C. INCURVA Lightf. (F.). Dunrossness, *Lightf. Fl. Scot.* 1777. East of Spiggie Loch ! ; Quendal, *Beeby*.

2628. C. PULICARIS L. (F.). Frequent in Unst !, *E. Fl.* Ronas Hill !, *C. C.* Scalloway ! ; Ollaberry, *Beeby*. Laxfirth. Cliva Hill. Hoo Field. Tingwall. Colvadale. Gallow Hill. Clibberswick. Saxavord. Hermaness. Mousa.

2629. C. DIOICA L. (F.). Uyea ; Yell ; Fetlar, *E. Fl.* Bressay, *Tate*. Springfield ; Unst ; Asta, *Beeby*. Tingwall. Hoo Field. Colvadale.

†2651. PHALARIS CANARIENSE L. Alien. Scalloway ; Loch End, *Beeby*. Lerwick, 1921.

2655. P. ARUNDINACEA L. (F.). Abundant, *E. L. & Fl.* Ness, North Yell, *Tate*. Unst ; Mainland, *C. C.* Ollaberry, *West*. Tingwall ; Fair Isle, *Beeby*. Spiggie. Scalloway. Brousta. Eala Water. Dunrossness. Bressay. Haroldswick. A conspicuous feature in marshy fields north-west of Norwick. The green as well as the purplish panicled plants occur.

Var. *†PICTA L. Burn side, Loch of Cliff. Waste ground, Balta Sound.

2657. ANTHOXANTHUM ODORATUM L. (F.). Common, flowering through the summer, *E. Fl.* Scarpoe, Unst, *Tate*, 1865. Ollaberry, *West*. Lerwick ; Scalloway ; Saxavord !, *Beeby*. Bressay. Mousa. Balta Isle.

2662. ALOPECURUS PRATENSIS L. (F.). Not very common. Ollaberry, *E. Fl.* Balta Sound. Tingwall, 1920. Lerwick. Bressay.

2666. A. GENICULATUS L. (F.). Common, *E. L. & Fl.* Unst; Lerwick!, *C. C.* Scalloway. Setter. Bressay. Dunrossness. Uyea Sound. Haroldswick.

2673. PHLEUM PRATENSE L. (F.). Abundant, *E.L.* Probably introduced, *E. Fl.* Buness, Unst, *Tate.* Scalloway; Bressay, *Beeby.* Tingwall. Lerwick. Balta Sound, as a robust dark-stamened plant, with a bulbous root, the Black Timothy, which comes under var. **intermedium* Schultz.

2684. AGROSTIS ALBA L. (F.). Common, *E. L. & Fl.* Unst: Ollaberry, *West.* Foula, *Beeby.* Tingwall. Lerwick. Bressay.

Var. STOLONIFERA (L.). (F.). Unst: Ollaberry, *West.* Clickhimmin, *Beeby.* Balta Sound.

Var. COARCTATA Hoffm. Ollaberry; Clickhimmin!, *Beeby.* Lerwick, 1920. Spiggie. Sumburgh. Bressay.

Var. MARITIMA Meyer. (F.). Balta Sound; Ollaberry, *Beeby.*

2685. A. CAPILLARIS L. = TENUIS Sibth. = VULGARIS With. (F.). Everywhere common, *E. L. & Fl.* Uyea, *Tate.* Unst: Ronas Hill, *C. C.* Ollaberry, *West.* Colvadale!, *Beeby.* Scalloway. Hoo Field. Bressay. Mousa. Setter. Saxavord.

[A hybrid with *canina* and a var. *montana* Hartm. are recorded for the Faroes.]

Var. PUMILA (L.) Druce. Not unfrequent, *E. Fl.* Rather common, *Beeby.* Unst; Ollaberry, *West.* Clickhimmin, *Beeby.* Balta, 1920. Lee of Setter. Colvadale. Saxavord. Hermaness. Hoo Field. Burga Water.

2687. A. CANINA L. (F.). Dry heaths, *E. Fl.* Scarce. Balta Sound; Skelberry; Aithness, *Beeby.* Hoo Field. Hermaness.

Var. *MONTANA Hartm. Balta.

Var. MUTICA Gaud. Sneug, Foula, *Beeby.* Hoo Field.

[2694. *Arundo Calamagrostis.* Very rare, loch near Fedaland, North Maven, *E. L.* Needs confirming.]

2702. AMMOPHILA ARUNDINACEA Link. (F.). Common, *E. Fl.* Burrafirth, *C. C.* Spiggie: Clayval, *Beeby.* Sandwick. Sumburgh.

[*Apera Spica-venti* Beauv. Alien. (F.).]

2706. AIRA CARYOPHYLLEA L. Not unfrequent (*sic*), *E. Fl.* Only one specimen seen in a cornfield between Scalloway and Tingwall, *Beeby*. In 1921 I came across it in a native station on slaty rocks near Scalloway, where it was plentiful.

2707. A. PRAECOX L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Ubiquitous as at Hillswick; Balta; Saxavord, *Beeby*. Bressay, *Tate*. Mousa. Balta Isle. Hermaness. Ronas. Sumburgh. Sundabanks.

2709. DESCHAMPSIA CAESPITOSA Beauv. Common, *E. Fl.* Burravoe, Yell, *Tate*. Ollaberry; Fair Isle, *Beeby*. Saxavord. Hermaness. Ronas Hill. Sumburgh. Dunrossness. North Maven, etc.

Var. ARGENTEA Gray (*pallida*). Hamna Voe; Gluss Burn; Ollaberry, *Beeby*. Bressay. Mousa. Haroldswick.

Var. *BREVIFOLIA (Parn.). Clibberswick.

[*D. alpina* R. & S. (F.).]

2711. D. SETACEA Hack. East side of Tingwall Loch, 1888 [there in 1920]; by a small loch, north-east side of Ronas Hill, abundant, 1892, *Beeby*.

2712. D. FLEXUOSA Trin. (F.). Abundant!, *E. L. & Fl.* Unst; Ollaberry, *West*. Lerwick, *Tate*. Weisdale; Ronas!; Walls!; Balta!; Foula, *Beeby*. Scalloway. Hoo Field. Burrafirth. Gallow Hill.

Var. MONTANA (Huds.). Top of Saxavord Hill!; Scallageil; Weisdale, at 135 metres, as forma *rigida*, *Beeby*. This last is a fine plant deserving further study. Hoo Field.

2713. HOLCUS MOLLIS L. (F.). Reawick, *E. Fl.* Laxfirth Voe *Beeby*.

2714. H. LANATUS L. (F.). Common!, *E. L. & Fl.* Buness! *Tate*. Unst; Burrafirth!, *Beeby*. Ollaberry, *West*. Bressay. Mousa. Common.

Var. *ALBOVIRENS Reichb. Tingwall. Scalloway.

[*Briza media* L. Alien. (F.).]

[2717. *Avena fatua* L. North Maven; Burrafirth, *E. Fl.* Not since observed. I suspect this is *A. pubescens.*]

2719. A. STRIGOSA Schreb. (F.). Alien. Not uncommon, *E. Fl.* Balta Sound. Tingwall. Lee of Setter. Bressay. This is the oat in common cultivation.

Sub-species *PUBESCENS Marq. Haroldswick, etc.

†2720. A. SATIVA L. (F.). Alien. Balta, *Tate*, 1866. Scalloway.

2722. A. PUBESCENS Huds. Burrafirth, as *Arrhenatherum*, 1866; Sundabanks ravine, *Tate*. Estwick Burn, Ollaberry; Cliva Hill; Kergord Burn, Weisdale; Sand Voe, *Beeby*. Petister. Loch of Cliff, 1920.

2724. ARRHENATHERUM ELATIUS M. & K. Not frequent, *E. Fl.* Rare, Mid Yell Voe; Scalloway, *Beeby*. Tate's plant is *Avena pubescens*. Bressay. Sumburgh.

2725. A. TUBEROSUM (Gil.) Druce. Common, *E. Fl.* Balta Sound. A troublesome pest in oat-fields. Many loads of the onion-like roots were collected from a single field.

2732. SIEGLINGIA DECUMBENS Bernh. (F.). Frequent!, *E. Fl.* Burravoe, Yell, *Tate*. Unst: Mainland, *C. C.* Ollaberry, *West*. Voesgarth!; Balta, *Beeby*. Dunrossness. Scalloway. Bressay.

2733. PHRAGMITES VULGARIS (Lam.) Druce. (F.). Loch near Ronas Hill, *E. L. & Fl.* Sand Lodge, *C. C.* Mailand; Sandsting, *Beeby*. Dunrossness.

†2737. CYNOSURUS ECHINATUS L. Alien. Bressay, 1840-1843, *E. L.* An accidental introduction.

2738. C. CRISTATUS L. Chiefly on limestone, *E. L. & Fl.* Tingwall!, *Beeby*. Unst; Ollaberry, *West*. Lerwick. Bressay. Norwick.

2745. MOLINIA CAERULEA Mönch. (F.). Frequent!, *E. L. & Fl.* Unst; Mainland, *C. C.* Scalloway; Ollaberry, *West.* Burwick; Fair Isle, *Beeby*. Bressay. Mousa. Balta Isle. Ronas Hill. Saxavord. Hermaness, &c.

Var. DEPAUPERATA (Lindley). Ronas Hill!; Vallafield!; Unst, *E. Fl.* Balta.

Var. BULBOSA Edm. Burrafirth, *E. Fl.*

Var. MINIMA Rabenh. Unst; Fair Isle, *Beeby*. To this Beeby refers the var. *bulbosa*. Hoo Field. Clibberswick. Colvadale.

2746. CATABROSA AQUATICA Beauv. (F.). Scarce, Tingwall; Lund; Whalsey, *E. Fl.* Quendal Bay; Hillswick, *Beeby*.

Var. UNIFLORA S. F. Gray. Ness Loch, N. Yell, as var. *minor*, *Tate*, 1865, in *Hb. Druce*.

2750. MELICA UNIFLORA Retz. Burn of Sundabanks, Scalloway, *E. Fl.* I could not find it, and it should be confirmed.

2751. DACTYLIS GLOMERATA L. (F.). Common, *E. L. & Fl.* Scalloway, *Beeby*. Unst, *West*. Bressay. Lerwick. Walls. Norwick, etc. Perhaps introduced.

2759. POA PRATENSIS L. (F.). Common!, *E. L. & Fl.* Lerwick, *Tate*. Uyea, *Beeby*. Bressay. Mousa. Balta Isle. Common and variable. A robust form with dark-coloured spikelets on the Cliffs of Burrafirth.

Var. SUBCOERULEA (Sm.). The usual Shetland form. Burrafirth, *Tate*. Hillswick; Queyfirth; Saxavord; Balta, *Beeby*. Lerwick. Setter. Scalloway. Bressay. Sumburgh. Spiggie. Sandwick.

*2759 (2). P. IRRIGATA Lindm. Burrafirth, and as a dwarf rock and sea shore form with scarcely protruding panicle; from Sandwick as a form "illa squamis perlatis, quae litora Scandinaviae dispersa est," teste C. Lindman.

2761. P. TRIVIALIS L. (F.). Common, *E. L. & Fl.* Buness, Unst, *Tate.* Lerwick!; Scalloway; Asta Voe!; North Roe; Benegast; Queyfirth; Burrafirth, *Beeby.* Ollaberry, *West.* Bressay. Mousa. Setter.

Var. *SEPTENTRIONALIS mihi. Tingwall. Lerwick. Balta. Burrafirth, etc. Characterised by its larger florets of a purplish-black colour. The stem puts out off-sets above the surface. so that it is a useful forage form which might be worth cultivation.

[2765. *P. compressa* L. Common, *E. Fl.* An error for a *pratensis* form.]

2769. P. ANNUA L. (F.) Everywhere common. *E. L. & Fl.* Scalloway; Hildasay, *Beeby.* Ollaberry, *West.* Unst, *C. C.* Bressay. Mousa. Balta Isle.

Var. PERENNIS Druce in Rep. B.E.C. 584, 1919. Spiggie Voe.

[*P. glauca*, *P. nemoralis*, and *P. alpina* are recorded from the Faroes.]

2772. GLYCERIA FLUITANS Br. (F.). Frequent!, *E. L. & Fl.* Lund. Unst, *Tate.* Hillswick Voe; Breiwick; Twart; Walls; Queyfirth, *Beeby.* Ollaberry, *West.* Scalloway. Cunningsburgh. Sumburgh. Bressay. Mousa. Uyea Sound. Norwick. Haroldswick. Mailand Burn.

Var. *TRITICEA Fr. Norwick. Ronas Voe, etc.

2774. G. DISTANS Wahl. (F.). South side of Balta Voe!, *Tate,* 1866. Bressay. Balta Sound.

Var. PROSTATA Beeby. Stony shore of Hildasay Isle, abundant about the landing place. *Scot Nat.* 38, 1889. Proves constant in culture, *Beeby.* Balta Sound, 1920. Bressay, 1921. Uyea Sound. A curious slender plant with a prostrate habit.

2776. G. MARITIMA Wahl. (F.). Not unfrequent. *E. Fl.* Balta Voe!, *Tate.* Queyfirth, *Beeby.* Ordale. Lerwick. Virkie.

2782. FESTUCA ELATIOR L. (F.). Loch of Cliff; Fetlar; Tingwall, *E. Fl.* Not seen at Tingwall; Lerwick, *Beeby.* Scalloway.

2785. F. RUBRA L. = DURIUSCULA (*sic*), E. Fl. (F.). Queyfirth; Burga Water, common, *Beeby*. Bressay. Mousa. Balta Isle. Uyea Sound. Setter. Ronas Voe. Lerwick. Walls. Sandwick. Cunningsburgh. Sumburgh. Spiggie.

Var. PRUINOSA Hack. (*glaucescens*). Burrafirth, *Beeby*, who thinks it is Edmondston's *elatior*. Norwick. Balta.

Var. LITTORALIS (Hack. as sub-var.). Burrafirth; Ollaberry, *Beeby*.

Forma GRANDIFLORA Hack. Ronas Hill, *Beeby*.

Var. *BARBATA (Hack.). Spiggie.

2787. F. OVINA L. (F.). Common, *E. L. & Fl.* Unst; Ollaberry, *West*. Bressay. Mousa, etc.

Var. VIVIPARA E. L. & Fl. (F.). Unst; Mainland, *C. C.* Ollaberry, *West*. Uyea; Eala Water; Ronas Voe!; Loch of Cliff!, *Beeby*. Scalloway. Hoo Field. Setter. Hermaness. Tingwall. Saxavord, etc.

Sub-var. LAEVIFOLIA Hack. Loch of Cliff, *Beeby*.

†2807. BROMUS COMMUTATUS Schrad. Alien. Occasionally, *E. Fl.* Quendal; Levenek, *Beeby*.

[2809. *B. arvensis* L. Rare, *E. L.* Error.]

2811. B. HORDEACEUS L. (*mollis*). (F.). Common, *E. L. & Fl.* Only seen at Hamna Voe and Sand Voe, *Beeby*. Scarce and doubtless introduced. Burrafirth, very luxuriant specimens.

Var. †*LEPTOSTACHYS (Pers.). Balta. Asta.

†2821. LOLIUM TEMULENTUM L. Alien, *E. Fl.* Tate suggests this is *italicum*.

2824. L. PERENNE L. (F.). Very frequent, *E. L. & Fl.* Lund, *Tate*. Lerwick, *C. C.* Ollaberry, *Beeby*. Common, Bressay. Mousa.

[*L. multiflorum* Lam. (F.).]

2827. AGROPYRON JUNCEUM Beauv. (F.). Most of the sea beaches and sands. Dunrossness!; Lund!; Sandwick; Unst, *E. Fl.* Norwick!, *Tate.* Mid Yell Voe; Burrafirth, *Beeby.*

× A. HACKELII Druce = JUNCEUM × REPENS = ? var. MARITIMA Edm. (F.). Lunna; near Sound; Lerwick; Hamna Voe; Burravoe, Yell, etc., *E. Fl.* Burrafirth; Mid Yell Voe; Norwick; Sand Voe, *Beeby.* To this must come a curious plant from Ronas Voe of which only a solitary specimen was seen in 1920.

2830. A. REPENS Beauv. (F.). Everywhere, *E. L. & Fl.* Lund, as *litoreum*, *Tate.* Norwick; Scalloway; Mid Yell; Fair Isle, *Beeby.* Lerwick. Bressay. Mousa.

Var. LEERSIANUM S. F. Gray. Buness, *Tate.* Mid Yell Voe, *Beeby.* Fair Isle, as *barbata*, *Beeby.* Lerwick. Norwick.

2847. NARDUS STRICTA L. (F.). Very common; scarce on limestone or serpentine, *E. Fl.* Bressay, *Tate.* Ronas Hill, *C. C.* Ollaberry; Unst, *West.* Scalloway. Bressay. Mousa. Hermaness. Saxavord.

2855. ELYMUS ARENARIUS L. (F.). Common, *E. L.* Dunrossness!, *E. Fl.* Burrafirth, *Tate.* Mid Yell Voe!; Asta Voe, *Beeby.* Spiggie. Scalloway. Sumburgh. Norwick. At Burrafirth it grew on a detached rock, 30 ft. high, to which seeds had been blown by the wind. The glumes are more acute than in most specimens.

2860. JUNIPERUS NANA Willd. (F.). Voesgarth, Unst, *E. Fl.* Cunningsburgh; Dunrossness, *Saxby Fl.* Dall of Lumbister, Yell; Björgs of Skelberry, *Beeby.* Ronas Hill, one plant, *West.* Fair Isle, *Beeby.*

[*J. communis* L. Cunningsburgh, *E. Fl.* xi. Voesgarth, Unst, *Saxby Fl.* Needs confirming.]

2867. EQUISETUM ARVENSE L. (F.). Frequent, *E. L. & Fl.* Burrafirth, *Tate.* Lumbister, Yell; Easter Quarffs; Twart; Sandwick, *Beeby.* Whiteness. Laxfirth. Petester. Uyea. Near Dales Voe. Bressay.

Var. ALPESTRE Wahl. Ollaberry, *Beeby.*

2868. E. SYLVATICUM L. (F.). Petester!, Woodwick, Unst;

Upper Sound, Lerwick, etc., *E. Fl.* Skaa!; Burrafirth; Queyfirth; North Maven, *Tate.* Sundabanks, *C. C.* Ollaberry, *West.* Ronas Voe. East of Feal.

2870. E. LIMOSUM L. (F.). Not rare, Loch of Cliff!, *E. Fl.* Lerwick, *C. C.* Common, Ollaberry, etc., *Beeby.* Spiggie. Lunga. Tingwall. Bressay. Dunrossness. Loch of Lund. Houllma Water.

2871. E. PALUSTRE L. (F.). Common, *E. L. & Fl.* Bressay, *Tate.* Ollaberry; Sandwater Loch; Weisdale; Loch of Cliff!; Fair Isle, *Beeby.* Hoo Field. Dunrossness. Loch of Lund. Uyea. Norwick, etc.

[*E. pratense* Ehrh. (F.).]

2876. PTERIS AQUILINA L. (F.?). Common, *E. Fl.* Unst; Mainland, *C. C.* A dwarf state at Burrafirth, *Tate.* Clousta, *Beeby.* Ronas Voe, near whaling station!, *West.*

2878. BLECHNUM SPICANT With. (F.). Abundant, *E. Fl.* Bressay, *Tate.* Unst; Mainland, *C. C.* Setter Mill; Clousta; Sundabanks; Asta, *Beeby.* Ollaberry, *West.* Near Spiggie. Burga Water. Cliva Hill. Hoo Field. Mousa.

2879. PHYLLITIS SCOLOPENDRIUM Newm. Sundabanks; Scalloway; Cunningsburgh, *E. Fl.* I could not find it.

2880. ASPLENIUM MARINUM L. Burrafirth sea caves!, *Peach,* 1864. North side of Vermentry; Fair Isle, *Beeby.*

2881. A. TRICHOMANES L. (F.). Rocks about Hamari Water; south side of the North Voe of Clousta, *Beeby*, 1907.

2882. A. VIRIDE Huds. Muckle Heog, 400 ft., *Tate*, 1865. East side of Hjoags, Unst, *Beeby.*

2885. A. ADIANTUM-NIGRUM L. (F.). Harold's Grave. Muckle Heog!; Balta Sound!, *C. C.* Hoo Field!; Cunningsburgh; Hjoags!; Unst; Fetlar, *Beeby.* Burga Water, a lax form. Cliva

Hill. Skaa. Clibberswick, on the hill and cliffs. Colvadale. Saxavord.

2886. A. Ruta-muraria L. On rocks about the North Loch of Hostigates, *Beeby*, 1907.

2889. Athyrium Filix-foemina Roth. (F.). Abundant, Burrafirth !, etc., *E. Fl.* Ronas Hill, *C. C.* Sundabanks, *Beeby*. Cunningsburgh. Eala Water. Clibberswick. Petester. Hermaness, etc.

Var. *convexum Newm. Burrafirth. Watlee.

[*Polystichum Lonchitis* Roth. (F.).]

2896. Dryopteris Filix-mas Schott. (F.). Abundant, Burrafirth ! ; Lerwick !, *E. Fl.* Not common between Queyfirth and Ollaberry ; Mavisgrind !, *Beeby*. Burga Water. Ronas Voe. Hermaness. Skaa.

2899. D. aristata Druce (*Lastrea dilatata*). (F.). Lerwick ! ; Bressay ! ; Saxavord ! ; Burrafirth ! ; Ollaberry, *Tate*, 1866. Yell, *C. C.* Haroldswick ! ; Mavisgrind ! ; Collafirth ! ; Clousta Voe ; Vementry ; Ward of Hostigates ; Grud Burn ; Gelligoe ; Sandwick, *Beeby*. Sundabanks. Burga Water. Eala Water. Setter. Skaa. Hermaness. Saxavord.

Var. alpina Moore. Setter Mill ; Clousta Voe. *Beeby*. Saxavord. Hermaness.

2902. D. Oreopteris (Presl) (*montana*). North Roe, *E. Fl.* Mouth of the Grud Burn ; Ronas Voe ! ; floor of Picts House, Björgs of Housetter, *Beeby*.

[2903. *D. Thelypteris* A. Gray. Scalloway ; Quendal, *E. Fl.* An error, *Tate*.]

2906. Cystopteris fragilis Bernh. (F.). Petta Water Burn, between Petta Water and Sandwater, *Beeby*, 1909.

2907. Polypodium vulgare L. (F.). Frequent !, *E. L. & Fl.* Loch of Cliff ! ; Hostigates ; Clousta ; Hamari Water ; Skelberry ;

Mavisgrind!; Housetter; Asta!, *Beeby*. Sundabanks. Hoo Field. Clibberswick.

Var. BREVE Lange. Saxavord!, *Beeby*. Hoo Field. Clibberswick.

2908. PHEGOPTERIS POLYPODIOIDES Fée. (F.). Near Busta, *E. Fl.* Björgs of Skelberry, 550 ft.; Uyea; Pettadale, *Beeby*.

2909. P. DRYOPTERIS Fée. (F.). Ravine of Clayva Burn, 1890; Neeans, 300 ft., Septia Fields; Ronas Voe, *Beeby*, 1896.

2917. HYMENOPHYLLUM PELTATUM Desv. (*Wilsoni*). (F.). Near Skaa!, *E. Fl.* Burrafirth, *Peach*, 1864. Top of Saxavord and hill at west side of Burrafirth, *C. C.* Björgs of Uyea and Skelberry, *Beeby*. Still very abundant on the south side of the Skaa ravine.

2918. OSMUNDA REGALIS L. Very rare, one tuft near Sandwick, Unst, *E. Fl.* South Loch of Hostigates; Flatpunds Loch; Galta Water; Burga Water, *Beeby*. Still in good condition on the holm in Lunga Water.

2919. BOTRYCHIUM LUNARIA Sw. (F.). Common, *E. L. & Fl.* Balta Sound; Uyea Sound!; Ollaberry; Tingwall!; Fladabister!, etc., *E. Fl.* Haroldswick, *Tate*. Between Boddam and Exnaboe; Ronas Voe!; Cruciefield!; Unst; Fetlar, *Beeby*. Abundant about Balta Sound, even on the turfy lawn of the hotel. Norwick. Clibberswick. Muckle Heog. Colvadale. Whiteness Voe. Brousta Water. Cliva Hill.

2920. OPHIOGLOSSUM VULGATUM L. Burn of Sundabanks, *E. L.* Cunningsburgh, *E. Fl.* I could not find it. The plant may have been the following.

Var. POLYPHYLLUM Braun. Fine turfy ground, Breiwick, *Beeby*, 1896.

2924. ISOETES LACUSTRIS L. (F.). Loch of Cliff; Watlee!; Tingwall!, 1888; Bardister!; Kirkiegarth!, *Beeby*.

Var. FALCATA Lange. Tingwall!; Watlee!, *Beeby*, 1889.

2925. I. ECHINOSPORA Dur. (F.). Culeryn; Clousta; Burga

Water!; Kirkiegarth; Bardister!; Gibbies Law Burn; Hamari Water, *Beeby*.

2927. LYCOPODIUM ALPINUM L. (F.). Abundant on Ronas Hill, *E. Fl.* At 800 ft.!, *Tate.* Björgs of Uyea; Skelberry; Sandy Loch. *Beeby*.

[*L. annotinum* L. (F.).]

2929. L. CLAVATUM L. Ollaberry, *Tate*, 1866. Vallafield, rare, *C. C.* Buness, Unst, *Shoolbred*. Hoo Field, very rare, 1921.

2931. L. SELAGO L. (F.). Common, *E. L. & Fl.* Ronas Hill; Ollaberry, *Tate.* Between Queyfirth and Ollaberry; Burwick; Scalloway; Foula, *Beeby*. Unst; Mainland; Yell, *C. C.* Ronas Hill!, *West*. Hoo Field. Balta. Watlee. Clibberswick.

Var. *APPRESSUM Desv. Hoo Field. Colvadale.

2932. SELAGINELLA SELAGINOIDES Link. (F.). Common, *E. Fl.* Bressay, *Tate.* Unst; Mainland, *C. C.* Abundant on the serpentine at Unst, *West*. Voesgarth!; Septia Fields, *Beeby*. Common even in the hotel lawn, Balta Sound. Saxavord. Hermaness. Ronas Hill.

2934. NITELLA OPACA Ag. North end of Loch of Cliff!; Clickhimmin Loch!, 1886; Lumbister, *Beeby*. Bardister Loch. Burrafirth. Spiggie. Punds Water. Tingwall. Asta. Bardister.

*2936. N. TRANSLUCENS Ag. Bardister Loch, 1920.

*2943 (2). TOLYPELLA NIDIFICA Leonh. (*Nitella nidifica* Ag.). In 1920, in company with Prebendary Burdon, Col. Johnston, and T. Churchill, I collected this rare species in the Loch of Stenness, Orkney, this being the first time it was recorded for Britain. The previous gathering in the British Isles was in a too far advanced condition for figuring, and it was never re-gathered. In Stenness, in brackish water, the plant was luxuriant and in excellent condition. This year in the Loch of Huesbreek, Dunrossness, I found it as a small state, which Mr James Groves, however, named *nidifica*. It is an extraordinary instance of plant distribution as it has not been found in any of the pieces of water from the Northern Isles to the south-east of Ireland. On the continent it occurs in Sweden, Norway, Finland, and Russia, extending into North Germany and France, and as form *antarctica* as far south as Kerguelen Land.

2949. CHARA VULGARIS L. Ditch running into Tingwall Loch. *Beeby*, 1889.

*2950. C. CONTRARIA Braun. Huesbreek Loch, 1921.

2951. C. HISPIDA L. Loch at Uyea Sound, apparently the var. *brachycarpa*, teste Babington, *Tate*, 1866. I was unable to see it in 1921.

2955. C. ASPERA Willd. Tingwall Loch. *Tate*, 1866. North end of Loch of Cliff. *Beeby*. Watlee. Spiggie. Uyea Sound.

*2955 (2). C. DESMACANTHA Groves and Bullock-Webster. Bardister Loch. Loch of Cliff. Watlee.

2958. C. FRAGILIS Desv. Eala Water, *Beeby*.

2958 (2). C. DELICATULA Braun. Lower end of Tingwall Loch *Beeby*, 1889. Bardister. Kirkiegarth. Asta. Spiggie. Watlee, etc. On the stony margin of Tingwall and Asta Lochs it occurred as a robust tufted form.

21 OCT 1922

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a.	Species recorded in the *Flora* as doubtful, or an error, but not included, ...	9
b.	Species—Native, Adventive, or Casual, ...	23
c.	British Varieties and Forms, ...	140
d.	British Hybrids, ...	16
e.	Recorded in the *Flora* as extinct *(Diotis maritima)*, ...	1
f.	Aliens, ...	110
	Total, ...	299

Davey's policy of recording localities for plants other than these which are common and generally distributed throughout the county has been continued. The Supplement is an expansion of a local Flora, and is intended as a guide for amateur collectors and students of plant life resident in or on a visit to the county, who like to know what plants, in addition to rarities, they may expect to find in any part of it which they are exploring.

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In the identification of plants the compilers of the Supplement received great assistance from the Staffs of the Kew Herbarium and British Museum (Natural History), Mr A. Bennett, Mr C. Bucknall, Dr G. C. Druce, Mrs Gregory, Mr J. Groves, Prof. A. Henry, Mr A. B. Jackson, the Rev. E. F. Linton, the Rev. E. S. Marshall, Dr C. E. Moss, Mr H. W. Pugsley, Mr Clement Reid, the Rev. H. J. Riddelsdell, the Rev. W. Moyle Rogers, Mr C. E. Salmon, and Dr F. W. Stansfield.

The opportunity has been taken to correct some of the errors which found their way into the *Flora*. Many of them were noted by Davey in his interleaved copy thereof.

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(CONVENIENTLY ABBREVIATED REP. B.E.C.)

BY THE

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REPORT OF THE DISTRIBUTORS FOR 1920.

The most interesting features in the 1921 contributions are the specimens of the recently recorded British plant, *Tillaea aquatica*, the excellent specimens of Shetland and Orkney plants including *Plantago Edmondstonii*, sent by the Rev. R. J. Burdon and Dr G. C. Druce, and *Tolypella nidifica*, sent by Col. H. H. Johnston.

There is, perhaps, a rather unusual preponderance of the commoner plants, only of use to those constructing a series. The critical genera, *Rubus*, *Hieracium*, *Euphrasia*, *Salix*, and *Centaurea* are fairly well represented, but *Rosa*, the Batrachian *Ranunculi* and others are conspicuous by their more or less complete absence.

It is again necessary to remind the members of the rules of the Club, since failure to enclose a list of desiderata not only recoils on the member concerned but also involves much extra work for the distributors. This is even more true of the absence of lists of contributions and the extra label demanded by the rules. The quality of the specimens is on the whole good, but there is, nevertheless, considerable room for improvement in some cases.

Ethel N. Miles Thomas.
Eleanor Vachell.
Arthur E. Wade.

Department of Botany.
National Museum of Wales.
Cardiff.

LIST OF PARCELS RECEIVED.

Contributors.	No. of Sheets.	No. of Gatherings.
Adamson, R. S., ...	66	6
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Bishop, E. B., ...	24	4
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White, J. W., ...	141	12
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Anemone Pulsatilla L. Devil's Dyke, Cambs, April, 1921.—T. STEPHENSON.

Ranunculus bulbosus L., var. *dunensis* Druce. St Ouen's Bay, Jersey, April, 1921. In *Rep. B.E.C.* 495, 1910, I named this Jersey-dune plant var. *dunensis*, and sent specimens through the Club in 1910, when Dr Moss acted as the distributor. However, he makes no reference to it in the *Cambridge Flora*, but he includes *R. Aleae* Willk. as a distinct species, a plant of Portugal, Spain, Istria, S. Tyrol, and Algeria, as well as Sweden, Finland, etc., which he says "is quite a feature in some places on the dunes." The plant figured as *Aleae* has no corm, but in the *Flora* the corm is said to be "feebly developed or almost entirely absent." I have made a somewhat close search over the ground traversed in Jersey by Dr Moss, and although many hundreds of plants were examined I could find none that were cormless or that agreed with continental *Aleae*. I am inclined to think from the description of the plant and its habitats that *dunensis* is, at any rate in part, the Jersey *Aleae*. Dr Thellung agrees that the plants distributed are not *Aleae*, to which Rouy & Foucaud only give sub-specific rank.—G. C. DRUCE.

R. auricomus L., var. *incisifolius* Reichb. Magdalen College Walks, Oxford, May, 1904.—G. C. DRUCE. "So I should name it."—SALMON.

R. parviflorus L. Newport, Countess Wear, Exeter, S. Devon. Garden weed and in waste places, May 12, 1921.—W. S. M. D'URBAN "Yes, excellent specimens, finely presented. Hooker gives 6-8 in., mine are 15 in."—PEARSALL.

R. heterophyllus Weber, var. *triphyllus* (Hiern). Ponds at Tytup, near Dalton, N. Lancs, June 6, 1921.—W. H. PEARSALL. "I believe so: showing the smaller flowers and more regularly tripartite leaves of this variety."—SALMON. "Beautiful specimens, a real gain to the Herbarium."—RIDDELSDELL.

Caltha palustris L., var. *Guerangerii* (Bor.). Yarnton, Oxon, May, 1921.—G. C. DRUCE.

Trollius europæus L. Hilly pasture, Nentsbury, near Alston, Cumberland.—C. WATERFALL.

Fumaria ————? Casual weed in garden, Putney, Surrey, July, 1921.—H. E. FOX. "This weed is the same as was sent to the Club by Mr Fox in 1917. As was then pointed out, it is merely a depauperate shade form of *F. officinalis*, the product of a town garden—and cannot be assigned to any variety. Degenerate fumitories of this type, belonging to various species, come up frequently in my garden at Wimbledon, and are quite worthless as botanical specimens, except to show how far degeneration can be carried in the genus."—PUGSLEY.

F. officinalis L., var. *Wirtgeni* Hausskn. Purwell Field, Hitchin, Herts, June 9, 1921. With *F. micrantha* Lag. Sepals minute, 1.5-2 mm. Fruit *not* broader than long, neck evident.—J. E. LITTLE. "Correctly named; racemes rather larger than usual."—PUGSLEY.

Barbarea intermedia Bor. Cultivated ground, Westerleigh, W. Gloster, April 20, May 10, 1921.—IDA M. ROPER. "Yes; the spinulose, ciliate upper leaves, is noticeable chiefly towards the basal margin and axis, and seems to be a reliable character.—WHELDON. "Correct."—RIDDELSDELL and PEARSALL.

Arabis hirsuta Scop. Old wall on canal bank, near Lancaster, W. Lancs, June 2, 1921.—C. WATERFALL. "This may be *A. conferta* Reichb., which is distinguished by its very short styles from *A. hirtella* Jord. and *A. gracilescens* Jord."—WHELDON.

Cardamine pratensis L. Three distinct forms grew in a wet, mossy field near Wigginton, Oxford, May 1921, along with *Juncus*, *Ophioglossum*, etc.; the slightly higher parts, even only a few inches higher, produced *Avena pratensis*, *Koeleria*, etc. The forms of *Cardamine*, besides the type, were one with large, pure white petals, and another with narrow, lilac petals, almost upright. Both the latter are distributed. Druce, *Fl. Oxf.*, refers to them. The pure white petals frequently dry to a slightly lilac tinge. *N.B.*—The plants were mixed indiscriminately. There was no distinction between them as to soil or amount of water.—H. J. RIDDELSDELL.

C. amara L. Edge of canal bank, near Mollington, Cheshire, May 21, 1921.—C. WATERFALL.

Draba azoides L. Penard Castle, Glamorgan, March, 1921, well maintaining its ground.—E. N. THOMAS. "Most interesting and acceptable."—PEARSALL.

Cochlearia alpina Sweet. Dry moorlands above Nenthead, alt. 1600 ft., near Alston, Cumberland, June 13, 1921.—C. WATERFALL.

C. anglica L. Estuary of the River Exe, a mile above Topsham, on mud covered at high tide, S. Devon, March 31, 1921.—W. S. M.

D'Urban. "Gathered too early for clear distinction between type and variety."—Riddelsdell.

C. danica L. Shingle beach, near Deal, Sussex, April 1, 1920.—H. E. Fox. "Yes; from one of the three stations mentioned in *Fl. Kent*."—Salmon.

Sisymbrium strictissimum L. Casual weed (source unknown) in garden, Putney, Surrey, July and August, 1921. Given in Nyman's *Consp. Fl. Europ.* for Germany, Switzerland, N. Italy, Austria, Poland, and Serbia.—H. E. Fox.

S. pannonicum Jacq. Waste ground, Grangetown, Cardiff, Glamorgan, June, 1920.—A. E. Wade. "Yes."—Riddelsdell. "The older name is *S. altissimum* L."—Druce.

S. officinale Scop., var. *leiocarpum* DC. Stackyard, Great Bromley, N. Essex, June 16, 1921.—G. C. Brown.

Bursa pastoris Weber. [W. 865.]. Sible Headingham, N. Essex, October, 1921.—G. C. Druce.

Lepidium Draba L. Botley, Oxon, May, 1921.—G. C. Druce.

L. ruderale L. Roadside, Putney, Surrey, June 30, 1921.—H. E. Fox. Also from canal bank, on clay waste, Newton Abbot, S. Devon, August 31, 1921.—C. Waterfall. "Correct."—Druce.

Thlaspi alpestre L., form approaching var. *occitanicum* (Jord.). Banks of River Ystwyth, near Llanydraian, Cardiganshire, alt. 50 ft., May 2, 1921.—C. V. B. Marquand. "An interesting N.C.R."—Druce.

T. alpestre L., var. *occitanum* (Jord.). (1) Bank of R. Nent, near Alston; (2) walls about Nenthead; (3) about lead mines, Nenthead; (4) Garrigill, Cumberland, June, 1921.—C. Waterfall. "*T. occitanicum* Jord. has a *ripe* capsule not much longer than broad, deeply notched, with a long style; *T. Grandinianum* Jord., a more elongated capsule, less deeply notched, with a long style; *T. virens* Jord. has practically no notch and a long style; *T. sylvestre* Jord., a shorter and broader capsule with style about equalling the *Grandinianum* like notch: *T. sylvium* Gaud. has a very narrow, elongated capsule with a very slight notch and a long style; *T. montanum* L., a capsule only a little longer than broad, notch shallow with a long style. The capsules on Mr Waterfall's plants that came to me were not ripe, but they seem to come nearest to those of *Grandinianum*."—Salmon. "The correct name is *T. alpestre* L., var. *occitanicum* (Jord.), but these plants are not good representatives of Jordan's species."—DRUCE.

Reseda alba L. By chalk pit, Marcham, W. Norfolk, August 27, 1921.—F. ROBINSON.

R. alba L., var. *Lecoqii* J. Muell. Railway bank, Brislington, near Bristol, N. Somerset, August 9, 1921.—IDA M. ROPER. "Passed as *lutea* only by Dr Thellung."—DRUCE.

Viola silvestris Lam., emend Reichb., var. *punctata* Druce. Hedgebank, Wraxall Hill, N. Somerset, April 14 and May 31, 1921. —IDA M. ROPER. " Rightly named."—GREGORY.

V. silvestris Kit. Hedgebank, Clapton - in - Gordano, N. Somerset, April 20 and June 2, 1917.—J. W. WHITE. " Rightly named."—GREGORY.

V. variata Jord. On cultivated peat, Stribers, N. Lancs, June 11, 1921.—W. H. PEARSALL.

V. tricolor L., var. Banks of the Nent, near Alston, Cumberland, June 27, 1921.—C. WATERFALL.

V. Curtisii Forster, var. *Pesnaui* Lloyd et Fouc. [= *V. Pesnaui* E. G. Baker (fide W. G. Travis)]. [1110]. Growing among *Psamma arenaria* and mosses in Shell-scully Links, near the seashore, alt. 10 ft., Backaskaill Bay, Cross, Sanday, Orkney, May 16, 1921. N.C.R. for v.-c. 111, Orkney. First found by me in Orkney at Sty Wick, Lady, Sanday, May, 1920, and at Quoy Ness, Cross, Sanday, in August 1920. At all these stations the plants grew in Shell-scully Links near the seashore, away from cultivated land, and the flowering season lasts from May to September.—H. H. JOHNSTON " The name should be *Pesneaui*"—DRUCE.

Silene italica Pers. Near Greenhithe, Kent, October 1921. Reported as extinct, but thanks to Mr Pickard's directions (who previously found it in this habitat), Mrs Wedgwood and I were enabled to see it growing in large quantity in October 1921, when, with one exception, the plants were over flower. The habitat is a bank above a chalk-pit, where it must have grown for many years, but its method of introduction is only conjectural.—G. C. DRUCE.

Cucubalus baccifer L. Hort. Putney. Origin, near the shore, Woody Bay, N. Devon, July 1920.—H. E. FOX. " Yes, a most interesting discovery."—DRUCE. Also from seed, 1921.—T. STEPHENSON.

Arenaria verna L., var. *Gerardi* (Wahl.). On dry rocks, Kynance Valley, Lizard, Cornwall, June, 1921.—H. DOWNES.

Sagina apetala Ard., var. Wall at Dooleylane, between Stockport and Marple, Cheshire, June 4, 1921.—R. S. ADAMSON. "Weak examples of *S. procumbens*, coming under var. *spinosa* Gibs."—SALMON. "The pendulous flowers, short pedicels, broad blunt sepals and sterile central rosette are all against this determination. This state is frequent here on both sides of the Mersey, and is, I think, *S. procumbens*, var. *apetala* Fenzl."—WHELDON.

Geranium Robertianum L., near var. *celticum* Ostenf. Origin, Silverdale, W. Lancs,—cult. Walton, S. Lancs, July 28, 1921. In habit, leaves, clothing, and relative length of petioles, this is very like var. *celticum*, but I am not sure of its real position.—J. A. WHELDON.

Acer campestre L., var. *incisifolia*. Twinstead, N. Essex, October 1921.—G. C. DRUCE. "This evidently makes an approach to var. *palmatifidum* Tausch."—SALMON.

Cytisus scoparius Link. Tadmarton Heath, Oxon, May, 1921. There are two or three distinct races of broom on Tadmarton Heath. (A) has pale green foliage, flowers pure yellow, sepals with membranous tips, no crimson about the shrub. This is the common form of the species. (B) has buds, standard, and calyx more or less suffused with crimson, and foliage sometimes very dark. The crimson of the petals tends to disappear with age, and in the dried plant simply appears as a darkish blotch.—H. J. RIDDELSDELL. "Yes."—PEARSALL.

Medicago hispida Gaertn., var. *confinis* Burnat. Waste ground, Hythe Quay, Colchester, N. Essex, August 13, 1920.—G. C. BROWN. "I should put this under *M. tuberculata* Willd., which is probably synonymous."—PEARSALL. "This is Burnat's var. *confinis* of *M. hispida*. Grenier and Godron's *tuberculata* is closely allied, but is essentially different from *M. tuberculata* Willd. See Rouy *Fl. Fr.* v., for distinguishing characters."—DRUCE.

Melilotus alba Desr. Cultivated field, Merton, W. Norfolk, August 29, 1921.—F. ROBINSON.

Trifolium strictum L. Dry pasture, Caerthillian Valley, Lizard, Cornwall, June, 1921.—H. DOWNES.

T. Molinerii Balb. Waste ground on the coast, Lizard Point, Cornwall, June, 1921.—H. DOWNES.

Lotus hispidus Desf. Wick, near Christchurch, Hants, July, 1920. Coll. D. M. HEATH; comm. F. ROBINSON. Also from the Lizard, Cornwall, June 7, 1921.—H. DOWNES.

Vicia bithynica L. Wayside, near dwellings, Lizard Town, Cornwall, June, 1921.—H. DOWNES. "Yes, a robust form."—DRUCE.

V. narbonensis L. [1781]. Waste ground, Hythe Quay, Colchester, N. Essex, June 11, 1920.—G. C. BROWN. "Yes."—DRUCE, RIDDELSDELL, and PEARSALL.

V. lutea L. On cliffs by the coast, Landewednock, Lizard, Cornwall, June 7, 1921.—H. DOWNES.

V. angustifolia Reichardt, var. *Bobartii* Koch. Open soil in gravel pits, Delamere Forest, Cheshire, June 15, 1921. This is var. a. *typica* Rouy. It apparently comes under *V. angustifolia*, race *Bobartii*, var. *acuta* A. and G. Syn vi., 2, 933, 1900 = *V. angustifolia*, var. *acuta* Pers.—R. S. ADAMSON. "This is not Persoon's var. *acuta*, the leaves are not acute."—DRUCE.

Lathyrus tuberosus L. Cultivated fields, Fyfield, Essex, June 1920. Coll. D. M. Heath; comm. F. ROBINSON.

L. maritimus Bigel. Shingle beach, Kingsdown Kent, July, 1921.—H. E. FOX.

L. hierosolymitanus Boiss. Waste ground, by maltings, Hythe Quay, Colchester, N. Essex, June 30, and September 21, 1920. Dr Druce suggests name as probably correct.—G. C. BROWN. "Yes."—THELLUNG.

Pisum humile Boiss. and Noe. Waste ground, Hythe Quay, Colchester, N. Essex, August 13, 1920.—G. C. BROWN. "Probably this."—THELLUNG.

Prunus avium L. A "wild cherry" tree, self sown, growing in a plantation at Newport, Countess Wear, near Exeter, Devon, is about 40 ft. high, 8 ft. 9 in. in circumference 5 ft. from the ground, and is certainly not less than 70 years old. It presents characters intermediate between *Prunus avium* and *P. Cerasus*. It had at one time abundant suckers. The drupe is bright red and sweet tasted. The leaves become bright yellow and red in autumn.—W. S. M. D'URBAN.

Rubus.—Specimens of the following forms have been sent through the Club this year, often made up in packets assigned by request to individuals. Barton and Riddelsdell worked together in Surrey and Essex, and the packets of specimens distributed thence often contain sheets from both workers, and may be assumed to have their joint authority.—EDS.

In the following notes I tacitly assume the changes in nomenclature, etc., made since Rogers *Handbook* appeared. They are summarised in my paper in the *Journal of Botany* 1920, p. 101.—H. J. RIDDELSDELL.

R. ! fissus Lindl. Princethorpe Wood, Warwickshire, June 30, 1921.—L. CUMMING. "Correct."—RIDDELSDELL.

R. suberectus Anders. Badby Wood, Northants, August 6, 1921, with L. Cumming.—H. J. RIDDELSDELL.

R. Lindleyanus Lees. Badham [Badby], Northants, August 16, 1921.—L. CUMMING. "Right, with very hairy stems. The locality should be Badby (not Badham)."—RIDDELSDELL.

R. Bakeri F. A. Lees. Wimbledon Common, Surrey, July 12, 1921.—H. J. RIDDELSDELL. Also from W. C. BARTON.

R. pulcherrimus Neum. Wimbledon Common, Surrey, July 12, 1921.—W. C. BARTON and H. J. RIDDELSDELL. Bould Wood, Oxon, August 15, 1921. Round High Beech, Epping Forest, S. Essex, July 13, 1921. This species was most abundant and in magnificent condition this year.—H. J. RIDDELSDELL.

R. Selmeri Lindeb. Wimbledon Common, Surrey, July 12, 1921.—H. J. RIDDELSDELL. Also from W. C. BARTON.

R. ramosus Briggs. Littleworth and Abrook Common, Surrey, July 14, 1921. (Forma *umbrosa* on Abrook Common.).—H. J. RIDDELSDELL.

R. thyrsoideus Wimm. Dunstew, Oxon, July 23, 1921. A frequent N. Oxfordshire species.—H. J. RIDDELSDELL.

R. Godroni Lec. & Lam. Abrook and Littleworth Commons, July 14, 1921, and Wimbledon Common, Surrey, July 12, 1921.—H. J. RIDDELSDELL. Also from W. C. BARTON.

R. Godroni L. & L., var. *robustus* (P. J. Muell.). Badby Wood, Northants, August 6, 1921.—H. J. RIDDELSDELL.

R. pubescens Weihe, var. *subinermis* Rogers. Wimbledon Common, Surrey, July 12, 1921, and Abrook Common, Surrey, July 14, 1921.—H. J. RIDDELSDELL.

R. silvaticus W. & N. Badby Wood, Northants, August 6, 1921. Panicles are mostly on the small side, and when small are apt to be also compressed, with the lower branches sometimes lengthening more than usual in this species. The same feature occurred in *R. foliosus* (see below).—H. J. RIDDELSDELL. Also from L. CUMMING, August 16, 1921.

R. macrophyllus W. & N. Badby Wood, Northants, August 6, 1921. Enormous bushes with panicles frequently 2 or 3 ft. long.—H. J. RIDDELSDELL.

R. Colemanni Bab. Wimbledon Common, Surrey, July 12, 1921. Small open ground bushes.—H. J. RIDDELSDELL.

R. Sprengelii Weihe. High Beech, Epping Forest, S. Essex, July 13, 1921.—H. J. RIDDELSDELL.

R. pyramidalis Kalt., f. *umbrosa*. Badby Wood, Northants, August 30, 1921.—H. J. RIDDELSDELL. Also from W. C. BARTON.

R. pyramidalis Kalt. High Beech, S. Essex, July 13, 1921; f. *aprica* and f. *umbrosa*, Badby Wood, Northants, August 30, 1921.—H. J. RIDDELSDELL. Also sent by W. C. BARTON from High Beech.

R. lasioclados Focke, form going off towards *vestitiformis*. Ashby St. Ledgers, Northants, August 6, 1921.—H. J. RIDDELSDELL.

R. rusticanus × ? (sent as *R. angustifolius* Rogers). Epping Forest, S. Essex, July 13, 1921.—H. J. RIDDELSDELL.

R. lasioclados Focke, var. *angustifolius* Rogers. Durdham Down, Bristol, W. Gloster, July 10 and 27, 1921. See *Rep. B.E.C.* 219, 1917. From the same locality.—J. W. WHITE. "Yes: excellent material."—RIDDELSDELL.

R. mucronatus Blox., f. *umbrosa*. Badby Wood, Northants, August 6, 1921.—H. J. RIDDELSDELL.

R. anglosaxonicus Gel., forma. Sheen Common, Surrey, July 15, 1921. I believe this is correctly named.—H. J. RIDDELSDELL.

R. anglosaxonicus Gel., var. *vestitiformis* Rogers. Nuffield Common, Oxon, July 28, 1920. Not at all satisfactory, though better than the plant which I named for Druce with considerable reserve from the same locality (See *Rep. B.E.C.* 1920, where my qualification should have been quoted). Also from Bould Wood, Oxon, August 29, 1921; the best Oxfordshire sample of this plant that I have seen, and good enough to found a N.C.R. upon. Also from Bourton Woods, E. Gloster, August 18, 1921, a form very much on the *leucostachys* side of the *vestitiformis* series, as is usually the case in E. Gloster.—H. J. RIDDELSDELL.

R. Radula Weihe. Hucclecote, E. Gloster, July 9, 1920, and Wimbledon Common, Surrey, July 12, 1921. On Wimbledon Common there is a very instructive series of plants ranging from good *Radula* to good *echinatoides* Rogers. Some sheets showing this fact are now distributed.—H. J. RIDDELSDELL.

R. Radula Weihe, var. *anglicanus* Rogers. Ashby St Ledgers, Northants, August 6, 1921, and Sheen Common, Surrey, July 15, 1921. Jackson sent a specimen, apparently from this same bush, some years ago to Rogers, who named it *podophyllus*, and indeed the stalked glands were much shorter then than in 1921. But I have examined the sheet again and feel certain that it is *anglicanus*, as well as that now sent, so that the record of *podophyllus* from Sheen Common goes out. Jackson and Barton assent to this decision, though we are aware that our combined authority may not gain general acceptance when set over against W. M. R.'s, and as a rule would not deserve it. On the difference in glandular development, see general remarks under *argenteus*.—H. J. RIDDELSDELL.

R. rudis W. & N. Badby Wood, Northants, August 6, 1921, in quantity and usually with reduced panicles.—H. J. RIDDELSDELL. Also from L. CUMMING, August 16, 1921. "Certainly, but in the same wood grows *R. oigocladus* Rogers, so far as I could tell from late gathered specimens (August 30). And there appear to me to be intermediates which would be difficult to assign to either species, though I see no other ground for supposing them to be crosses of the two.—RIDDELSDELL.

R. echinatus Lindl. Highbury Wood, Hallatrow, N. Somerset, August 4, 1921, flowers pale pink.—IDA M. ROPER. "No doubt correct, but material is shade grown and weak and so far uncharacteristic."—RIDDELSDELL.

R. Babingtonii Bell-Salt. Wimbledon Common, Surrey, July 12, 1921.—H. J. RIDDELSDELL. Also from W. C. BARTON.

R. festivus Muell. & Wirtg. Littleworth and Abrook Commons, Surrey, July 14, 1921. A lovely plant, in great abundance.—H. J. RIDDELSDELL.

R. ericetorum Lefv. Bould Wood, Oxon, August 15, 1921. I believe rightly named; for, though I do not know the species well, this seems to fit description save in the small and shade grown panicle.—H. J. RIDDELSDELL.

R. Bloxami Lees. Badby Wood, Northants, August 6, 1921. Leaves less cuspidate-acuminate than in the Bournemouth plant.—H. J. RIDDELSDELL.

R. fuscus W. & N. Wood on Wigginton Heath, Oxon, with 3-nate leaves as a rule, July 24, 1920. Also Buckholt Wood, Cranham, E. Gloster, August 13, 1920. Coll. M. DAY; comm. H. J. RIDDELSDELL. Also from Combe Wood, Warwickshire, July 16, 1921.—L. CUMMING. "This seems to me to be a form of *fuscus* going off in some respects to *obscurus*, but I am not quite certain."—RIDDELSDELL.

R. fuscus W. & N., var. *nutans* Rogers. Abrook Common, Surrey, July 14, 1921.—H. J. RIDDELSDELL.

R. foliosus W. & N. Bould Wood, Oxon, August 15, 1921. Odd looking, small, shade grown material, but perfectly typical in critical detail. Note the lengthening lower branches of panicles when in advanced fruit (see above under *silvaticus*).—H. J. RIDDELSDELL.

R. adornatus P. J. Muell. Wimbledon Common, Surrey, July 12, 1921.—H. J. RIDDELSDELL. Also from W. C. BARTON.

R. opacus Focke. Abrook Common, Surrey, July 14, 1921, in company with Britton and Barton, both of whom were my companions on the Surrey Commons on July 12 and 14, and in Epping Forest on July 13.—H. J. RIDDELSDELL.

R. affinis W. & N. Wimbledon Common, Surrey, July 12, 1921.—H. J. RIDDELSDELL. Also from W. C. BARTON.

R. imbricatus Hort., var. *londinensis* Rogers. Wimbledon and Sheen Commons, Surrey, July 12 and 14, 1921.—H. J. RIDDELSDELL. Also from W. C. BARTON.

R. incurvatus Bab. Tackley Copse, Oxon, July 23, 1921, and Four Shire Stone, E. Gloster, August 18, 1921. Like several others of the Rhamnifolii this species varies much in the hairiness of its stem.—H. J. RIDDELSDELL.

R. argenteus W. & N., var. *robustus*. Badby Wood, Northants, August 6, 1921.—L. CUMMING. "Yes, I think so, but badly dried."—RIDDELSDELL.

R. argenteus W. & N., f. *glandulosa*. Wimbledon Common, Surrey, July 12, 1921. This species, I feel sure, needs revision. We include under it, without even suggesting distinction as varieties, several forms which seem widely different. As a west country plant, I know *R. argenteus* well, but the glandular Surrey plant when I saw it first did not suggest this name or any other near it for a long time. I am rather coming to the conclusion that the arrangement of our forms along lines of variation in armature must be accepted with some caution, as undoubtedly Rogers saw. We get, for instance, an eglandular *foliosus*, a highly glandular *argenteus*, and several Rhamnifolian species may have a pretty thick clothing of hair on the stems. See Rogers *Handbook*, p. 29, on the difficult variations of *R. argenteus*.—H. J. RIDDELSDELL. Also from W. C. BARTON.

R. carpinifolius W. & N. Wimbledon and other Commons, Surrey, July 1921.—H. J. RIDDELSDELL.

R. Koehleri W. & N., var. *dasyphyllus*. Brendon Wood, Warwickshire, July 16, 1921.—L. CUMMING. "Characteristic. It should be quoted as *R. dasyphyllus* Rogers."—RIDDELSDELL.

R. Bellardi W. & N. Badby Wood, Northants, August 6, 1921. Quite magnificent in foliage, though good panicles were hard to come by.—H. J. RIDDELSDELL. Also from L. CUMMING.

R. dumetorum aggr. White (*Bristol Flora*, 287) says of *R. dumetorum* aggr. that its very great variability "almost entirely depends on the clothing and foliage of the barren shoot; the panicle features remaining much the same throughout, and exhibiting differences of quite minor importance." I should venture to question the justice of this remark, both in view of Rogers' descriptions, of the sheets now distributed, and of the facts. One or two facts will illustrate my meaning. The outline of the panicle varies greatly; compare for example *diversifolius* and *raduliformis*; the glandular and acicular development of rachis and pedicel shows great differences between, *e.g.*, *tuberculatus* and *ferox*. The direction of the sepals and colour and size of the flowers are very different in different varieties. In fact almost every feature which comes under the critic's eye varies markedly in some direction or other. Mr White's remark, however, would fit the forms grouped under *corylifolius* very well.—H. J. RIDDELSDELL.

R. dumetorum Weihe, aggr. Lane, Colchester, N. Essex, June 28, 1921. Riddelsdell says of this *in litt.*—"This is not *concinnus* of Warren, being far too glandular and prickly. Petiole of terminal leaflet is too short. But it is nearer to that var. than to any other of our named forms."—G. C. BROWN. "This seems to be a form which Brown has sent me more than once from E. England. It is not the only *Rubus* form which seems peculiar to that district. *Rubus* work in his area ' pays ' well ; there were some 9 or 10 N.C.R.'s established from the parcel he sent me in 1921."—RIDDELSDELL.

R. britannicus Rogers. Quarry, Bourton on Hill, E. Gloster, August 18, 1921.—H. J. RIDDELSDELL.

R. diversifolius Lindl. Bourton Woods, E. Gloster, August 18, 1921.—H. J. RIDDELSDELL

R. dumetorum Weihe, var. *fasciculatus*. Combe Wood, Warwickshire, July 16, 1921.—L. CUMMING. " I think so."—RIDDELSDELL.

R. Balfourianus Blox. Littleworth Common, Surrey, July 14, 1921.—H. J. RIDDELSDELL. Also from Combe Wood, Warwickshire, July 16, 1921.—L. CUMMING. " Yes."—RIDDELSDELL.

R. Chamaemorus L. Ashgill Wood, Alston, Cumberland, June 13, 1921.—C. WATERFALL.

Rosa cryptopoda. Bourne, Lincolnshire, August 22, 1921.—ALFRED WEBSTER. " *R. canina* L. of group *lutetiana* Lem. There is nothing of ' *cryptopoda* ' in the specimen."—BARCLAY. " Certainly not *cryptopoda*, but a *canina* form which I should place under var. *lutetiana* (Lem.) which sometimes runs to similarly woolly styles."—WOLLEY-DOD.

R. canina × *micrantha*. Hogtrough Bottom, Chipstead, Surrey, August 7, 1921. [2419]. Before leaving England in the early part of 1921, Lt.-Col. Wolley-Dod directed my attention to the occurrence of a hybrid rose, perhaps new to science, in the neighbourhood of Chipstead, and expressed a wish for it to be collected and distributed. The rose, although occurring in fair quantity, was found to be fruiting rather sparingly, showing, in addition, undeveloped fruits that fell away. The specimens exhibit very well the admixture of characters derived from *R. micrantha* Sm. and a member of the group of *R. canina*. The acicles on the flowering shoots are noticeable and recall those of *R. Rothschildii* which, perhaps, has a similar origin.—C. E. BRITTON. " This is, so far as I can judge from the specimen, correctly named but, for certainty, one would like to see a number of specimens gathered at different stages. There are traces of acicles on the branches and, though not sterile, the fruits appear much fewer than usual in the parents."—BARCLAY. " This seems to be the rose I found a few years ago in this station.

which was pronounced by Dingler to be the above hybrid, which is not recorded by Keller in Asch. & Graeb. in *Syn. Mittel-Eur. Fl.* In 1920, when I had intended to gather it for distribution, it produced practically no fruit (much of it was abortive the previous year), so I asked Mr Britton if he would kindly collect it for the Club last year. It is a most interesting addition to the British list."—WOLLEY-DOD.

R. dumetorum Thuill., var. *incerta* (Déségl.). Ashton Common, Bristol, N. Somerset, June 29, and August 25, 1921. Flowers pale pink.—IDA M. ROPER. "Yes; this var. is hardly worth distinguishing from the var. *Déséglisei* Bor. The present specimen has some traits of *R. stylosa* Desv."—BARCLAY. "Correct."—WOLLEY-DOD.

R. tomentosa Sm. Bourne, Lincolnshire, August 24, 1921.—ALFRED WEBSTER. "Yes; var. *scabriuscula* Sm."—BARCLAY. "Not *tomentosa*; the leaflets are much too glabrous and the styles practically quite so. It is one of the *scabriusculae*, nearest to *R. tomentosa*, var. *sylvestris* Woods, though the prickles are straighter than normal."—WOLLEY-DOD.

Pyrus ——— ? Border of wood on the Cadbury range above Clapton Wick, N. Somerset, May 24, 1921. A tree of 40 ft., rendered conspicuous at a distance by its foliage being grey on both surfaces. Unfortunately there were no flowers this season. At one time I should have thought it to be *P. intermedia* Ehrh., the leaves having the same deep marginal incisions with overlapping sides possessed by the Cheddar plants. But the late Rev. A. Ley remarked that they had greyer felt than was usual with *P. intermedia*. He expected Prof. Hedlund to describe them under another name. (See *Fl. Bristol* 306). This Cadbury tree differs so widely from any form of *Aria* that it may well belong to a named species or sub-species, and I trust some definite fact respecting it may be obtained for the *Report*.—J. W. WHITE.

P. torminalis Ehrh. Newport, Countess Wear, near Exeter, S. Devon. A tree of considerable size (planted about 80 years ago). May, 1921.—W. S. M. D'URBAN.

Tillaea aquatica L. Adel, N.-W. York, September 15, 1921, shown me by R. Butcher. See *Rep. B.E.C.* 281, 1921.—G. C. DRUCE.

Callitriche polymorpha Lönnr. Haroldswick, Unst, August 1921. The fruit was extremely rare, but a few were noticed which had the characteristic long style. We also saw it in Beeby's classic locality. The species has a distinct facies being of a yellower green colour and with larger leaves than *C. intermedia* or *C. stagnalis*. Although some scores of plants were gathered only a few bore fruit. But sterility is common in Shetland plants, so that one is unable to say that it is due to crossing. Some botanists assert that *polymorpha* is *stagnalis* × *intermedia*. If so, the offspring is unlike either of the putative parents.—G. C. Druce.

C. autumnalis L. Esthwaite Water, N. Lancs, September 3, 1921.—W. H. Pearsall.

Cucumis myriocarpa Naudin. Waste ground, Bradford, N.-W. York, August 25, 1921. Named at Kew. First found July, 1920. In abundance last summer. New to Britain, I believe.—J. Cryer. "Yes."—Druce.

Bupleurum rotundifolium L. Several fields at Rousham, Oxon, July 23, 1921, in quantity. Not nearly so frequent in cornfields now as was the case 50 to 100 years ago.—Riddelsdell. "Seems to be the true plant and not *B. protractum* which often does duty for it in local lists."—Wheldon.

Apium nodiflorum Reichb. fil. Oughton Head, Hitchin, Herts, June 30, and September 3, 1921. This small form, often erect and less than 10 in. in height, grows in thick masses in a bog this year partially dried up, but normally soft, wet peat. The plants appear to be seedlings of last autumn, and their condition is analogous to that of *Veronica Anagallis* L. (segr.), var. *glandulosa* Druce, of which I found a plant, annual or over-winter, similar to those described in *Rep. B.E.C.* 271, 1912, from another locality in this district. Except as growth forms there seems to be nothing to separate these plants from more typical, more branched, and more luxuriant plants on the water's edge, but their habit is strikingly different.—J. E. Little. "Young, but typical."—Riddelsdell.

A. inundatum Reichb. fil. Exminster, Devon, in marsh ditches, in dense masses, May 23, 1921.—W. S. M. D'Urban. "Yes; luxuriant enough for *Moorei*."—Riddelsdell. Also creeping on mud of dried-up watercourse, Borth, Cardigan, June 22, 1921.—L. Cumming.

Foeniculum vulgare Mill. Waste ground, Galmpton Quay, S. Devon, September, 1921.—C. Waterfall. Seedlings from Tickenham Hill, N. Somerset, August 16, 1921.—Ida M. Roper.

Selinum Carvifolia L. Chippenham, Cambs, August 1921.—T. Stephenson.

Kentranthus ruber DC. Shingle beach, Kingsdown, Kent, July 28, 1921.—H. E. Fox.

Valerianella olitoria Poll. Gravelly field on coast, near Bure, W. Lancs, June 4, 1921.—C. Waterfall. " Our two examples are var. *lasiocarpa* Reichb."—Salmon and Riddelsdell.

V. ———— sp. Waste ground, in very small quantity, Meole Brace, Salop, July, 1921.—J. Cosmo Melvill. " Very interesting. This is *V. eriocarpa* Desv. which I have never seen so tall (18 in.) before. The fruits of this species figured in *E.B.*, ed. 3, t. dclxxiii., should be compared with those of *V. dentata*, var. *eriocarpa* (= *mixta* Dufr.) shown in Leighton *Fl. Salop*, t. i. *V. eriocarpa* seems a new record for v.-c. 40."—Salmon. " *V. eriocarpa*."—Riddelsdell. " Yes, a N.C.R."—Druce.

V. carinata Lois. Weed in cultivated soil, Ilminster, Somerset, July 4, 1921.—H. Downes. " Yes; very young."—Druce and Riddelsdell.

Dipsacus pilosus L. Banks of Rea Brook, between Meole Brace and Pulley, Salop, July, 1921. All specimens sent are from one gigantic plant, 5 ft. high.—J. Cosmo Melvill.

Solidago canadensis L. Ground formerly used as an army camp, Thetford, E. Norfolk, July 11, 1921.—F. Robinson. " Yes; a frequent find on rubbish tips."—Riddelsdell.

Aster Linosyris Bernh. About Dent Head, near Brixham, S. Devon, September 9, 1921.—C. Waterfall.

Antennaria dioica Gaertn. Connor Downs, Cornwall, June 5, 1921.—H. Downes.

Anaphalis margaritacea Benth. & Hook. fil. Waste ground, Radyr, Glamorgan, September, 1921.—R. L. Smith. " This species is in some parts of Glamorgan so abundant as to give a peculiar hue to miles of the country, *e.g.*, along the railway in the Rhymney Valley. I have seen whole mountain cliffs smothered with it."—Riddelsdell.

Achillea Millefolium L., " florulae roseae." Pastures, Walton, S. Lancs, July 31, 1921. In addition to the deep rose-coloured flowers, the pericline is very slightly hairy and the margins of the phyllaries are almost concolorous, the usual brown margin being either much reduced or absent.—J. A. Wheldon. " Under the type, as a colour form."—Druce.

Anthemis nobilis L. [1499 and 1546]. Artificial pasture, alt. 60 ft., Beaquoy, Birsay, Mainland, Orkney, September 29, 1921. The late Mr Magnus Spence's station for *Matricaria Chamomilla* L. (*Fl. Orcadensis* 37, 1914.). My specimens agree with those of *Anthemis nobilis* L. from other Orkney localities. It is found near houses in Mainland, where it, no doubt, was originally planted for medicinal purposes.—H. H. JOHNSTON.

Chrysanthemum ———? Naturalised on shingle beach, Kingsdown, Kent, July, 1921. A large form is cultivated in cottage gardens, whence these probably originated.—H. E. FOX. "Probably *C. maximum* Ram., teste Thellung, but the limits of this and *C. lacustre* Brot. are not well defined."—DRUCE.

Matricaria phaeocephala Rupr. Burrafirth, Unst, Shetland, August 3, 1921.—R. J. BURDON. "Seems correct."—SALMON and RIDDELSDELL. "*M. inodora* L., var. *phaeocephala* Rupr., a very common and striking plant in the Shetlands. See *Rep. B.E.C.* 494, 1921."—DRUCE.

Artemisia vulgaris L., var. *coarctata* Forselles. Gallows Point. Beaumaris, Anglesey, August 11, 1920.—J. E. GRIFFITH. "The commonest form of the species in England."—RIDDELSDELL.

A. gnaphalodes Nutt. See *Rep. B.E.C.* 824, 1919. Gallows Point, near Beaumaris, Anglesey, August 13, 1920.—J. E. GRIFFITH. "Dr Thellung named the specimen sent to him *A. Absinthium*. The specimens referred to in *Rep. B.E.C.* 824, 1919, which I gathered in the same station [Q 71] were named at Kew. My own feeling at the time was that it was a variety of *Absinthium* for the type plant grew with these and seemed distinct. I will send Dr Thellung my original gathering."—DRUCE.

Senecio vulgaris aggr., *multicaulis* Trow, var. *radiatus*. Cream-flowered form. See *Journ. Genetics*, vol. 11, No. 3. Near Cardiff, Glamorgan, October, 1921. First time observed except under experimental cultivation.—E. VACHELL.

Arctium ———? Waste ground, Bradford, M.-W. York, July 21, 1921. These are lateral branches of one large plant growing in association with six plants of *Arctium minus* Bernh. Its whitish-grey webbed heads gave it a very conspicuous appearance amongst the others.—J. CRYER.

Cnicus eriophorus Roth. Leaves of seedlings. This species. introduced from an Oxford locality, fruits and reproduces itself freely in my garden. The first leaves are quite undivided.—H. J.

RIDDELSDELL. "Yes; but *Cirsium* is the recognised generic name, and the plant is var. *britannicum*."—DRUCE.

Cirsium heterophyllum Hill. Nentsbury, near Alston, Cumberland, June, 1921.—C. WATERFALL.

Centaurea Jacea L., sub-sp. *C. jungens* Gugler. var. *variisquama* Gugl. [1974 A]. Hort. West Barnes, Merton, Surrey. Root originally from Epsom Downs. This is one of the species intermediate between sub-sp. *C. eu-jacea* and sub-sp. *C. angustifolia* Gugler. The appendages to about as far as the centre of the pericline are somewhat cleft into laciniae, linear, or broader, apparently consisting of two or more united, but are never more than pectinate-fimbriate. In colour they range from whitish to dark-brown, generally with a darker centre and lighter teeth. The uncultivated plant has the habit of Billot's Fl. Gall. Germ. Exsc. No. 264 ter (*C. Jacea*), differing only in the less numerous phyllary-appendages. Briquet referred Billot's plant to *C. Jacea*, var. *pratensis*, viz. *C. pratensis* Thuill., but this, like the Epsom Down plant, can scarcely be a *pratensis* form owing to the shape and fission of the appendages.—C. E. BRITTON.

C. Jacea L., sub-sp. *C. angustifolia* Gugler. Epsom Downs, Surrey. Considerable diversity is shown by the plants contributed under the above name, hence various reference numbers. It should also be borne in mind that the season 1921 was one of extreme drought, necessarily affecting the full development of these plants of the chalk downs, but it is thought that they are correctly referred to sub-sp. *C. angustifolia* rather than to sub-sp. *C. jungens*.—C. E. BRITTON.

C. nemoralis Jord., var. *diversifolia*, var. nov. [2367]. Hort. West Barnes, Merton, Surrey, July 15, 1921. See *Rep. B.E.C.* 413, 1921.—C. E. BRITTON.

C. nemoralis Jord., forma. [601]. Ashmansworth, N. Hants, on chalk, 750 ft., August 7, 1921.—W. C. BARTON. "Apparently under my var. *subintegra*. See *Rep. B.E.C.* 413, 1921."—BRITTON.

C. nemoralis Jord., forma vel var. [2425]. Hort. West Barnes, Merton, Surrey, August 12, 1921. This Knapweed is identical with a form that has been the subject of study on the part of Mr C. C. Laciata, who has given it a name not yet published. It is frequent in the southern counties of England, and has been recognised by Mr Lacaita in French herbaria under the erroneous names of *C. microptilon* Gren., *C. decipiens* Thuill., *C. serotina* Bor., etc.

This form is alluded to at greater length in *Rep. B.E.C.* 414, 1921. —C. E. BRITTON.

C. ———? Ashmansworth, N. Hants, below beech trees on chalk, 750 ft., August 7, 1921.—W. C. BARTON. "*C. nemoralis* Jord., under my var. *diversifolia* (but not typical), f. *radiata.*"—BRITTON. "Pappus absent, flowers radiant, leaves narrow. Probably a form of *C. pratensis* Vaill. = *C. nigrescens* auct. plur. = *C. jaceoides*, var. *nigrescens* Leol."—WHELDON.

C. obscura Jord., var. *subnemoralis*, var. nov. [2209]. Hort. West Barnes, Merton, Surrey, June 24, 1921. See *Rep. B.E.C.* 409, 1921.—C. E. BRITTON.

C. nigra L., var. [1866]. Roadside, Stoke-by-Nayland, W. Suffolk, June 26, 1921. Bracts slightly spreading, apparently nearest *C. nemoralis.*—G. C. BROWN. "A weakly-grown state of *C. obscura* Jord."—BRITTON.

C. nigra L., var. [W. 77]. Lane End, Bucks, August, 1921.—G. C. DRUCE. "Excellent specimens of *C. nemoralis* Jord., var. *diversifolia*, f. *radiata.*"—BRITTON. "Combinations of rayed flowers with crowned achenes seem rare with us, and are all classed as hybrids by Savouré. The pappus somewhat imperfect and radiate heads of this plant bring it into Savouré's 4th group of hybrids, and it is probably *C. nigra*, var. *radiata* DC., which is *C. pratensis* × *obscura* according to his arrangement."—WHELDON.

C. nigra L., f. *longiflora* = *obscura* Jord., f. *longiflora.* [1822]. Hort. West Barnes, Merton, Surrey. Root from Shepperton, Middlesex, June 26, 1921. See *Rep. B.E.C.* 408, 1921.—C. E. BRITTON. "A very handsome form of *C. obscura* Jord. In describing the shape of the appendages of the phyllaries it must be understood that the median rows are meant. The lowest ones are always much narrower."—WHELDON.

Arnoseris minima S. & K. Cultivated field, Hinton Admiral, Hants, July 1920. Coll. D. M. HEATH; comm. F. ROBINSON.

Lapsana communis L. Leaves and stem hispid. Arable field, Taplow, Bucks, June 26, 1921.—A. WEBSTER. "Var. *pubescens* Reichb. See Koch *Syn. Fl. Germ.* ii., 1616."—DRUCE.

Crepis biennis L. Near Abberley, Worcestershire, June 1921.—G. C. DRUCE.

C. taraxacifolia Thuill. Achenes. Parwell, Hitchin, Herts, June 9, 1921. The beak of the achene does not develop until the fruits are advancing to maturity, hence the difficulty of distinguishing from *C. biennis.* The capitula vary much in size but are generally smaller than those of *C. biennis.* Although the latter is given as a native species its occurrence is rare and uncertain in N. Herts and I suspect that it is introduced with seeds.—J. E. LITTLE.

C. mollis Aschers. Meadow near Nenthead, Alston, Cumberland, June 24, 1921.—C. WATERFALL.

Picris hieracoides L., var. [514]. Old chalk pit, Marham, W. Norfolk, August 27, 1921.—F. ROBINSON.

Hieracium Peleterianum Mérat. Rozel, Jersey, April, 1921.—G. C. DRUCE. "I agree."—CRYER.

H. ———? Near Bromsgrove, Worcestershire, July, 1921. Coll. Miss WILKINSON; comm. G. C. DRUCE. "This is a form of *H. pratense* Tausch."—CRYER.

H. britannicum F.J.H. Great Ormes Head, Carnarvon, on Carboniferous Limestone, May 27, 1920.—J. CRYER.

H. silvaticum Gouan, var. *subcyaneum* W. R. Linton. Linton, M.-W. York, on Carboniferous Limestone, June 11, 1921.—J. CRYER. "Apparently correct; but the teeth at the base of the leaves are very small in comparison with plants thus named by Ley and W. R. Linton, where they run to ½ in. in length. The clothing of the pedicels seems to vary. All my specimens show a quantity of long dark-based hairs and sometimes a few short, strong, stalked glands. In Cryer's specimen these are almost wholly missing."—RIDDELSDELL.

H. pellucidum Laest. Damp wooded bank, Beldy Mill, the S. Tyne Garrigill, Cumberland, alt. 1400 ft., June 25, 1921.—C. WATERFALL. "No; the dark broad anthodes of *pellucidum* are vastly different from this. The shape of the anthode suggests *cinderella* Ley, but the thick clothing of long, white hairs all over the upper part of the plant puts it away from that. I cannot name it."—RIDDELSDELL. "Not *H. pellucidum*, which has punctato-pellucida leaves and dense nigro-glanduliferae phyllaries. This is *H. sagittatum* Lindeb., var. *philanthrax* Dahlst."—J. CRYER.

H. serratifrons Almq., var. *lepistoides* Johanns. Railway embankment near Llanishen, Glamorgan, May 1921. Coll. A. E. WADE and Miss E. VACHELL; comm. NAT. MUS. OF WALES, DEPT. OF BOTANY. "Correctly named."—RIDDELSDELL and CRYER. Also from railway embankment, Cefn-on, Glamorgan, May 1921.

Coll. A. E. Wade; comm. Nat. Mus. of Wales, Dept. of Botany. "Leaves are small for this var. Heads very dark. But I cannot suggest any other name."—Riddelsdell. "Does not belong to the sub-vulgata group, but to the eu-vulgata, and I name it, with some doubt, *H. scanicum* Dahlst. Note the long glands of the phyllaries."—Cryer.

H. serratifrons Almq., var. *cinderella* Ley. Railway embankment, Cefn-on, Glamorgan, May 1921. Coll. A. E. Wade; comm. Nat. Mus. of Wales, Dept. of Botany. "Yes; seedling plant." —Riddelsdell. "Not *cinderella* Ley, which has narrow, cuneate-based heads, very long, narrow phyllaries, and strongly ciliate ligules. I think it is a young form of *H. serratifrons* Almq., var. *lepistoides* Johanss."—Cryer.

H. sagittatum Lindeb., var. *philanthrax* Dahlst. Crag Gill, on Carboniferous Limestone, M.-W. York, July 3, 1920.—J. Cryer.

H. duriceps F.J.H., var. *cravoniense* F.J.H. Ingleton, in a new station, M.-W. York, July 17, 1921.—J. Cryer.

H. vulgatum Fr., var. *subravusculum* W. R. Linton. Near Bodorgan Station, Anglesey, June 11, 1920.—J. E. Griffith. "So I name it."—Cryer.

H. vulgatum Fr., forma. Machynlleth, Montgomery, June, 1921. —G. C. Druce. "Yes."—Cryer.

H. sciaphilum Uechtr. G. N. Railway, Benslow, Hitchin, Herts, June 9, 1921.—J. E. Little. "Correctly named, I should say."—Linton. "No; *H. scanicum* as we have applied the name in Britain."—Riddelsdell. "I think this best placed to Ley's var. *transiens*."—Cryer.

H. protractum Lindeb. Cliva Hill, Shetland, July, 1921.—G. C. Druce. "Correctly named."—Cryer.

H. subtruncatum Beeby. Eala Water Burn, Shetland, July, 1921, an extraordinarily local species.—G. C. Druce. "Yes."—Cryer.

H. stictophyllum Dahlst., var. *serpentinum* F.J.H. [509]. By the river, Bethesda, and lower reaches of mountain, Carnarvon, July, 1921.—F. Robinson. "So I name it."—Cryer.

Hypochaeris maculata L. Cliffs at Kynance, Cornwall, June, 1921.—H. Downes. Also from Great Ormes Head, Carnarvon, June, 1868. Coll. J. Sidebotham; comm. S. H. Bickham.

Taraxacum dilatatum Lindb. f. Oxford, May, 1921.—G. C. DRUCE.

T. ———? [Y. 38]. The Parks, Oxford, May, 1921.—G. C. DRUCE.

T. ———? [Y. 40]. Stanton St John, Oxford, May, 1921.—G. C. DRUCE.

T. ———? [Y. 42]. Princes Risborough, Bucks, May, 1921.—G. C. DRUCE.

T. ———? [Y. 44]. Princes Risborough, Bucks, May, 1921.—G. C. DRUCE.

T. ———? [Y. 47]. Near Bicester, Oxford, May, 1921.—G. C. DRUCE.

T. ———? [Y. 50]. Stour Wood, Oxon, May, 1921.—G. C. DRUCE.

T. ———? [Y. 105]. Oxford Parks, Oxon, May, 1921.—G. C. DRUCE.

T. ———? [Y. 136]. Marcham, Berks, May, 1921.—G. C. DRUCE.

T. ———? Dry field, Llandough juxta Cardiff, Glamorgan, May, 1921.—A. E. WADE.

T. ? *paludosum* Scop. Wet meadow, Honley, near Huddersfield, W. York, May 7, 1921. This does not seem quite typical as the leaves are somewhat deeply cut and the outer phyllaries not closely appressed.—R. S. ADAMSON.

Tragopogon porrifolium L. Several fine plants by roadside and among corn at Great Tey, N. Essex, May 29, 1921.—G. C. BROWN.

Jasione major Mert. & Koch. Loch Spiggie, Dunrossness, Shetland, July 20, 1921.—R. J. BURDON. "No doubt Mr Pugsley's new var. *latifolia* and not *major* Mert. & Koch."—SALMON. "*J. montana* L., var. *latifolia* Pugsley, a frequent form on the cliffs of the Shetlands. Cultivation is needed to prove the permanency of its assigned characters."—DRUCE.

Limonium humile Mill. Kirby le Soken, Essex, July 1917.—G. C. DRUCE. "Yes; *Statice humilis*."—SALMON.

L. bellidifolium Dum. Sand dunes, Old Hunstanton, Norfolk, August 21, 1921.—F. Robinson. "Yes; *Statice bellidifolia* DC. In *Journ. Bot.* 95, 1913, reasons were given why Dumortier's name should not be used. It is no doubt the *S. reticulata* of Hudson and Smith, but not of Linn."—Salmon.

Primula elatior Jacq. Wood near Takeley, Essex, May, 1921.—Coll. D. M. Heath; comm. F. Robinson.

Microcala filiformis H. & L. Kynance Moor, Cornwall, June 7, 1921.—H. Downes.

Erythraea pulchella Fr., f. *elongata* Wittrock. Sandy marsh at Berrow, N. Somerset, August 19, 1892. This may correspond to the *Centaurium pulchellum* Druce, var. *tenuiflorum* of Lond. Cat.; but of course it will not be the *E. tenuiflora* Hoffg. & Link = *E. arenaria* Presl.—J. W. White. "Yes, I think so."—Salmon. "*Centaurium pulchellum* Druce, f. *subelongatum* (Wittr.)."—Druce.

Gentiana Amarella L., var. *septentrionalis* Druce. Links of Moorburgh, Dunrossness, Shetland, July 28, 1921.—R. J. Burdon. "See *Rep. B.E.C.* 505, 1921."—Druce.

Symphytum peregrinum Ledeb. Naturalised near Wrington, N. Somerset, July 9, 1921.—J. W. White.

Mertensia maritima Gray. Isle of Arran, Clyde Isles, July, 1921.—T. Stephenson.

Myosotis ———? [Y. 70]. Chadlington, Oxon, May, 1921. This, Dr Thellung agrees, is a form of *M. pyrenaica*, of garden origin.—G. C. Druce.

Verbascum Chaixii Vill. Alien. Abandoned iron-works at Ashton Gate, Bristol, July 8, 1913.—J. W. White. "Probably."—Thellung.

V. ———? Waste ground, Meole Brace, Shropshire, July, 1921.—J. Cosmo Melvill. "*V virgatum* Stokes, teste Dr Thellung.

Limosella capensis Thunb. Waste ground, Bradford, M.-W. York, September 19, 1920. Named at Kew. New to Britain, I believe.—J. Cryer. "Yes; a first British station. Probably of lanal origin."—Druce.

Veronica Beccabunga L., var. *repens* Bosch. Twinstead, N.

Essex, October, 1921. This seems to be rather a condition of growth than a true variety.—G. C. DRUCE.

V. verna L. Thetford Heath, an extension of an old station, W. Suffolk, May 21, 1921.—F. ROBINSON.

V. triphyllos L. Brandon, Suffolk, May, 1921.—T. STEPHENSON.

Euphrasia borealis Towns. Cunningsburgh, Mainland, Shetland, July 20, 1921.—R. J. BURDON. " I think a form of *E. borealis*."—PUGSLEY. " Correct."—PEARSALL.

E. borealis Towns. Muness, Unst, Shetland, August 1, 1921.—R. J. BURDON. " We consider this handsome eyebright to be a large flowered form of *E. borealis* of which it seems to possess the essential features."—PUGSLEY and PEARSALL. " This seems to need a name. It was an extremely beautiful plant for which I suggest forma *pulchellifolium*."—DRUCE.

E. brevipila B. & G. Damp meadow land between Bere Regis and Wool Heath, Dorset, June 18, 1921.—J. COSMO MELVILL. "Correctly named; glandular hairs extremely scarce."—PEARSALL. "The sheet sent shows a coarse and luxuriant form of *E. nemorosa*."—PUGSLEY.

E. nemorosa H. Mart., var. *ciliata* Drabble. Rubbish heaps at ore mines, Mouzel, N. Lancs, September 20, 1921.—W. H. PEARSALL. " I think a form of *E. nemorosa*."—PUGSLEY. Also from paths, Harloch Reservoir, near Dalton in Furness, N. Lancs, September 16, 1921.—W. H. PEARSALL. " *E. nemorosa*, but showing little ciliation of the foliage."—PUGSLEY.

E. foulaensis Towns. Scalloway, Shetland, July 23, 1921.—R. J. BURDON. " This densely hairy little plant is certainly not *E. foulaensis* which is not villous and has broadly elliptical, emarginate capsules. I have seen this northern form sent out as *E. latifolia* Pursh, but do not think that identification correct and believe the plant to be at present unnamed."—PUGSLEY. " *E. latifolia*."—PEARSALL. " A distinct form from the Sutherland plant. It grew in the interstices of brick pavement and was very dwarf. The flowers were dark purple."—DRUCE.

E. gracilis Fr. Moor at Burrafirth, Unst, Shetland, August 3, 1921.—R. J. BURDON. "I think a form of *E. gracilis*."—PUGSLEY. " *E. foulaensis*."—PEARSALL.

E. scotica Wettst. Clibberswick, Unst, Shetland, August 11, 1921.—R. J. BURDON. " The sheet of specimens sent is not uniform, some plants having much more obtusely cut leaves than others. But I can believe they all belong to one form, which is perhaps a condensed state of *E. scotica* due to exposure on sea cliffs. The plants cannot be referred to *E. foulaensis* owing to their distinctly different capsules, and in their dry state they show a considerable resemblance to forms of *E. minima* Jacq."—PUGSLEY. "*E. foulaensis.*"—PEARSALL.

E. minima Jacq. Wet places on moor between Backbarrow and Newby Bridge, N. Lancs, June 30, 1921.—W. H. PEARSALL. "This is one of the forms usually referred to *E. scotica* Wettst., but is very different from the Braemar plant on which the species was founded by Townsend (as *E. paludosa*) in *Journ. Bot.* xxix., 161, 1891. The corolla is of similar form to that of *E. scotica*, but the habit and foliage recall *E. gracilis* Fr. and all the specimens seen are unbranched. I do not see a close resemblance to the alpine *E. minima* Jacq."—PUGSLEY.

E. Rostkoviana Hayne. Norwick, Unst, Shetland, August 8, 1921.—R. J. BURDON. "Flowers large enough for *Rostkoviana*, but the entire absence of long glandular hairs makes it impossible." RIDDELSDELL. "The two plants sent are glandular and are fine *E. borealis* Towns."—PUGSLEY and PEARSALL.

E. Kerneri Wettst. Chinnor, Oxon, September, 1921.—G. C. DRUCE. "Yes."—PEARSALL. "The two specimens on the sheet show quite small flowers and seem to be a dwarf form of *E. nemorosa.*"—PUGSLEY.

E. salisburgensis Funck. Dog's Bay, Galway, September, 1921. —G. C. DRUCE. "The Irish form of the species."—PUGSLEY.

E. ———? Westing, Unst, Shetland, August 12, 1921.—R. J. BURDON. "*E. borealis* Towns."—PUGSLEY and PEARSALL. "A common and widely distributed and very variable plant in the Shetlands, and often a great ornament to the pastures."—DRUCE.

E. ———? Norwick, Unst, Shetland, August 8, 1921.—R. J. BURDON. "*E. borealis* Towns."—PUGSLEY. "*E. borealis*, with one branch of *E. brevipila.*"—PEARSALL.

E. ———? Jedburgh, Shetland, August 17, 1921.—R. J. BURDON. "I think a form of *E. curta*, var. *glabrescens* Wettst., although some of the specimens show a few of the shortly stalked glands which characterise *E. brevipila.*"—PUGSLEY. "*E. brevipila.*"—PEARSALL.

E. ———? Moor at Unst, Shetland, July 30, 1921.—R. J. BURDON. Probably a mixture.—EDS.

Rhinanthus stenophyllus Schur. In a wet rushy field near Wigginton, Oxon, June 20, 1921, with *Ophioglossum*, *Koeleria*, *Avena pratensis*, etc.—H. J. RIDDELSDELL. "This is my idea of *R. minor* Ehrh. rather than *stenophyllus*."—SALMON. Also from Loch Spiggie, Dunrossness, Shetland, July 20, 1921.—R. J. BURDON.

R. groenlandicus Chab. Burga Water, Shetland, July 1921.—G. C. DRUCE.

Orobanche rubra Sm. Growing on thyme, Lizard Coast, Cornwall, June 7, 1921.—H. DOWNES. "Now called *O. alba* Steph."—DRUCE.

Utricularia minor L. [1514]. Mud at bottom of water, 2 in. deep, in a pool alt. 62 ft., The Loons, Birsay, Mainland, Orkney, October 1, 1921. Plants wholly submerged in water, and neither in flower nor in fruit. Mr Bennett says:—"Small interesting specimens with the turios (winter buds) at the apex of the plant. These seem only smaller specimens than usual of the species."—H. H. JOHNSTON.

Mentha longifolia Huds. Peterston super Ely, Glamorgan, July 1921. Coll. A. E. WADE; comm. NAT. MUS. OF WALES, DEPT. OF BOTANY. "This must be close to, if not identical with, var. *mollissima* Benth. in DC. Prod."—SALMON.

M. aquatica L. × *longifolia* Huds. or *M. longifolia* × *alopecuroides*. Roadside, Marham, W. Norfolk, August 27, 1921. —F. ROBINSON. "I believe this beautiful mint is *M. longifolia* × *rotundifolia*. I hope Mr Robinson will again collect this and dry examples showing the *lower* stem-leaves."—SALMON.

M. gracilis Sm., var. *cardiaca* (Baker). Edge of marsh, Cranberry Fen, Hockham, W. Norfolk, July 14, 1921. This plant exactly matches specimens of a plant, so named, cultivated at Bristol University and sent to the Club by Mr White. It had, when gathered, the strongest smell of any mint I ever came across.—F. ROBINSON. "Some of the leaves are rather broader than usual, but I think this is Baker's *M. cardiaca*."—SALMON.

M. rotundifolia Huds. Galmpton, S. Devon, August 24 and September 1, 1921.—C. WATERFALL.

M. ———? Beaumaris, Anglesey, July 1919. Thellung suggests *M. rubra* Sm. = *arvensis* × *aquatica* × *spicata*. I am rather inclined to think it a form of *M. cardiaca*.—G. C. DRUCE.

Thymus Serpyllum L., sub-var. *Linneanus* G. et G. Barry Island, Glamorgan, July 1920.—A. E. WADE.

Satureia montana L. Hort. Meole Brace, August 1921. Origin, Beaulieu Abbey ruins, S. Hants.—J. COSMO MELVILL.

Teucrium Scordium L. Ely, Cambs, August, 1921.—T. STEPHENSON.

Lamium moluccellifolium Fr. Cunningsburgh, Mainland, Orkney, July 20, 1921.—R. J. BURDON.

Plantago arenaria L. Formerly found on the coast of N. Somerset and at Kingswood, W. Gloucester. Now cult. in garden, Univ. Coll., Bristol, September 28, 1889.—J. W. WHITE. "The more correct name is *P. indica* L. Waldstein & Kitaibel are the authors of *P. arenaria*, a name not used by Linnaeus."—DRUCE.

P. Edmondstonii Druce. (*P. maritimus*, var. *minor* auct. p.p.) Balta Sound, Unst, August, 1921. See *Rep. B.E.C.* 515, 1921.—G. C. DRUCE.

Illecebrum verticillatum L. Moor near Land's End, W. Cornwall, August, 1921.—F. RILSTONE.

Herniaria ciliata Bab. On rocks and walls, Lizard, W. Cornwall, June 7, 1921.—H. DOWNES.

Corrigiola littoralis L. Edge of Slapton Lea, S. Devon, September 5, 1921.—C. WATERFALL.

Amaranthus chlorostachys Willd. Waste ground, Bradford, M.-W. York, October 7, 1921. In great abundance.—J. CRYER. "Yes."—THELLUNG.

Chenopodium polyspermum L., var. *cymosum* Moq. Waste ground, Blickling, E. Norfolk, September 4, 1921.—F. ROBINSON. "Yes."—SALMON.

C. ———? Waste ground, Bradford, M.-W. York, November 1, 1921. This plant has made its appearance for six successive years, but has never flowered until this year. All the specimens were prepared from one large plant, 39 in. high.—J. CRYER.

Atriplex patula L., var. *linearis* Moss & Wilmott. [2477].

Cultivated field, Lower Morden, Surrey, September 14, 1921.—C. E. BRITTON. Also from Ashton Gate, Bristol, N. Somerset, September 22, 1921.—IDA M. ROPER.

A. patula L., var. *angustissima* Gren. & Godr. [2476]. Cultivated field, Lower Morden, Surrey, September 14, 1921.—C. E. BRITTON.

A. ——? Waste ground, Bradford, M.-W. York, October 21, 1921. The plants were perfectly erect, and when full grown measured 36 inches.—J. CRYER. Doubtless of Australian origin.

A. portulacoides L. Salt marsh, Dawlish Warren, S. Devon, August 27, 1921.—C. WATERFALL.

Salicornia ——? Salt marsh, Dawlish Warren, S. Devon, August 27, 1921.—C. WATERFALL. "Of the two specimens sent one is *S. herbacea*, and the other may be the same, but is too ill-preserved to identify."—SALISBURY. "My single example seems a poor incomplete specimen of *S. herbacea*. See remark on *Carex paradoxa*."—SALMON. "*S. herbacea* L."—WHELDON.

Polygonum viviparum L. Field by R. Tees, near the Bridge forming the County Boundary, Upper Teesdale, W. York, June 16, 1921.—C. WATERFALL.

Polygonum Persicaria L. (A, B, and C.). Gabalfa, Glamorgan, 1921.—E. VACHELL. "(A). My examples are only portions of a plant—or plants—and thus difficult to name. I think they are var. *elatum* Gren. & Godr. (C). Seems the common state of *P. Persicaria* (*i.e.*, *agreste* Meisner). (B). Seems to me just *P. Persicaria*. Why not?"—SALMON.

P. minus Huds. Pool side near Sedbergh, N.-W. York, alt. 360 ft., July and August, 1921.—A. WILSON. "Certainly."—SALMON. "*P. minus*, var. *sub-contiguum* Wallich. I should say very similar to the form we find on stony lake-margins here. Praeger (*Irish Top. Bot.* 272) says 'abundant on stony lake-shores off the limestone.' Grenier & Godron state that it is a plant of siliceous soils. This is not the case with *P. minus* as a species, but is this var. so restricted."—PEARSALL.

P. aequale Lindm. Dry bed of pond, Westend Common, Esher, Surrey, September 25, 1921. Abundant as a small-leaved form approaching, perhaps identical with, sub-var. *parvulum* Moss Camb. Br. Fl. ii. p127 to 136 (d. e.), which is described as differing from the usual form of *P. aequale* by its smaller leaves and achenes.

Lindman (*Svensk Fanerogamflora* 216) gives a useful key to the forms of *P. aviculare.* (1). Fruit dull or slightly polished, finely striated or dotted. A. Floral leaves smaller and narrower than the lower leaves; perianth divided almost to the base, achenes with three concave sides = *P. heterophyllum* Lindm. B. All the leaves similar in shape and size; perianth divided to about the middle, achenes with two convex sides, the third concave = *P. aequale* Lindm. (2). Fruit polished, smooth, usually flattened, floral leaves as in B. = *P. calcatum* Lindm. The plant distributed seems to show some approach towards *P. calcatum* as the achenes are compressed-triangular with the concave surface very small in proportion to the two concave sides.—C. E. BRITTON. "Yes."—PEARSALL. "Has much of the facies of *calcatum*. It may be a hybrid but I will submit it to Prof. Lindman."—DRUCE.

Euphorbia Cyparissias L. Frimley (near Ascot), Surrey, August, 1921. Sent me by Lady de Manley. Growing among heather, a fact which seems to favour its being native in the locality. —H. J. RIDDELSDELL.

Mercurialis ambigua L. Chichester, October 3, 1921.—R. J. BURDON. "I saw *ambigua* growing at Chichester, but it is a condition which is not worth specific distinction."—DRUCE.

Ulmus major L. Longcoombe, Polperro, E. Cornwall, October 27, 1921.—F. RILSTONE.

U. carpinifolia Borck × *glabra* Huds. Priory Park, Hitchin, Herts, May 16, August 7, 1921. A and B from the same tree. (A). The normal leaves. (B). Apoblastic shoots. Also samaras.—J. E. LITTLE. "I think × *U. hollandica* Miller."—DRUCE.

Alnus rotundifolia Mill., var. Near Bray, Bucks, on banks of Thames, October, 1921. The size of the fruit catkin varies. The samples now sent were much larger than the general run. Whether large enough to go under var. *macrocarpa* I do not know.—H. J. RIDDELSDELL. "But *A. glutinosa* Gaertn. is the correct name."—DRUCE.

Salix alba L., var. *caerulea* (Sm.)? Planted. Field below Electric Light Works, Hitchin, Herts, April 20, 1921. These trees were planted about eight years ago from stands brought from Essex, and are now about 9 in. diameter across the trunk. At the end of October, 1920 the under surface of the lamina was covered with green appressed hairs, but had lost the silky bluish hairs which characterise it in summer. The twigs in autumn are not easily detached but are more fragile in early summer. The laminae are longer and broader than in typical *S. alba* (up to 10 cm. long by 2 cm. broad).—J. E. LITTLE. "Seems rightly named."—E. F. LINTON, FRASER, and PEARSALL.

S. fragilis L. Near Moormead, Hitchin, Herts, April 7, June 20, 1921.—J. E. LITTLE. "Yes, fairly typical."—PEARSALL. "I consider this to be *Salix alba* × *fragilis* (*viridis* Fries). The leaves are too broad for their length, and too hairy when expanding for *S. fragilis*. They get quite glabrous by September. The leaves of this specimen are immature. August and September are the best months to get foliage."—FRASER.

S. fragilis L. Well Head, Charlton, Hitchin, Herts, June 13, August 16, 1921. No flowers procurable. Shoots from a cut-down tree in the hedgerow. The early leaves very green beneath; the later glaucous and of characteristic *fragilis* appearance. I suppose only *S. fragilis*, although in the early leaves one was led to infer an element of *S. alba*.—J. E. LITTLE. "Probably *S. fragilis* only, but I agree that there is a suspicion of *S. alba* in it as well."—E. F. LINTON. "Correctly named, I think. There are no catkins, but the somewhat coarse serration and glabrescence of the young leaves eliminate *S. viridis* Fries which often has leaves similar."—PEARSALL. "Correctly named."—FRASER.

S. acuminata Sm. Pond, Ickleford, Herts, March 17, August 26, 1921. "Very fine specimens of *S. acuminata* Sm."—E. F. LINTON. The long, coarse, dark pubescence, which is so marked a feature of the stout terminal twigs in March, does not appear to be developed upon the spring shoots, and is, I think, also absent on late autumn branches produced low down. The latter come into leaf very early in the spring so that some branches may be bearing young leaves while others have flowers. There are about twenty bushes or small trees, 10-25 ft. high, irregularly scattered along the margin of the pond among other willows (*S. alba*, type, *S. alba*, approaching var. *vitellina*, fide E.F.L., *S. purpurea*, and *S. caprea* × *viminalis* (?), as to which latter Mr Linton writes, "I suppose correct, but am not quite satisfied that *S. caprea* is the other parent.") I cannot say that the bushes are of spontaneous origin, but the occurrence of *S. acuminata* in another swamp half a mile away among a similar medley of forms lends some colour to the suggestion. Yet another hybrid form of *S. caprea* × *viminalis*, "I think undoubtedly correct," E. F. LINTON, appears among these latter.—J. E. LITTLE. "Leaves somewhat smaller than usual, otherwise quite typical."—PEARSALL. "Correctly named."—FRASER.

S. caprea × *viminalis*. Great Wymondly, Herts, April 4, July

25, 1921. These sheets will afford comparison and contrast with *S. acuminata*. Although not recorded for N. Herts, the hybrid *S. caprea* × *viminalis* is not infrequent in the neighbourhood of Hitchin, if my determination is correct. In the present station there are about seven bushes, up to 20 ft. high, all pistillate, irregularly scattered along a small watercourse. There are about six other stations with bushes sometimes solitary, sometimes two or three together, some in wet ground and some in drier situations.—J. E. LITTLE. "Correct. The leaves on my sheet appear rather small and narrow for this hybrid, but Mr Little sent me last year leaves gathered much later. These are from the same bush, are much larger and, I think, quite conclusive."—PEARSALL. "I consider this to be *S. cinerea* × *viminalis* (*S. Smithiana* Willd.). The leaves get more or less rusty underneath as they get mature. This is due to the red hairs and often rusty character of the leaves of *S. cinerea*."—FRASER.

S. aurita L. Poaka Beck, N. Lancs, April 29, July 21, 1921.—W. H. PEARSALL. "Correctly named."—FRASER.

S. cinerea L. Sootfield Green, Herts, April 5, August 1, 1921.—J. E. LITTLE. "Correctly named."—PEARSALL and FRASER.

S. cinerea L., hermaphrodite form. Clay Lane, Chichester, June 4, September 2, 1921.—R. J. BURDON. "Most of the catkins on my sheet are heterogamous, having normal pistillate flowers below, and staminate or hermaphrodite flowers above. The bracts are sometimes normal, often sub-lanceolate, and much less hairy in the upper part than usual. The leaves are nearly entire, with margins narrowly reflexed and tips often twisted. They are light green in colour and ± glabrescent on both sides, while the twigs are obviously those of *S. cinerea* in the main. I suspect the influence of *S. aurita* also, but on the slender evidence of my sheet it is impossible to be certain."—PEARSALL. "This is a monstrous condition of the species to which I would apply the term 'androgynous.' The plants are male, and the stamens gradually change into ovaries, more or less perfect. I think it is due to a species of mite, possibly an *Eriophyes*. As some of the stamens remain perfect the plant would be monoecious rather than hermaphrodite. I have cultivated a state of *S. aurita* like this, and have seen *S. cinerea* several times in this state. See also *S. Croweana* Sm. in *Salicetum Woburnense*, t. lii., which is an analogous state of a male *S. phylicifolia* (L.) Sm."—FRASER.

S. caprea L. St Ippolyts, Herts, March 11, June 29, 1921.—J. E. LITTLE. "Yes."—PEARSALL. "Yes; the black and purple barked *S. caprea* L."—FRASER.

Populus tremula L. Vicarsgrove Wood, St Ippolyts, Herts, May 18, 1921. Sucker shoots about three years old, very soon glabrescent. The leaves on the old spurs are still silky. Similar sucker shoots at Hitchin Wood, 1913, were put by Dr Moss to var. *glabra* Syme.—J. E. LITTLE.

Spiranthes spiralis Koch. Grassy ground, Berry Head, near Brixham, S. Devon, 1921.—C. WATERFALL.

Orchis prætermissa Druce. [1288]. Halberton, near Tiverton, Devon, by the side of the Great Western Canal, June 11, 1921.—W. S. M. D'URBAN. "Yes."—Druce.

O. prætermissa Druce, var. *pulchella* Druce. Isle of Arran, v.-c. 100, July, 1921.—T. STEPHENSON.

O. eu-incarnata L. Wolvercote, Oxon, June, 1921. The true plant exceptionally abundant this year. Some years scarcely a plant appears.—G. C. DRUCE.

O. purpurella Steph. Form a, Aberystwyth, Wales, June, 1921; form b, Isle of Arran, v.-c. 100, July, 1921.—T. STEPHENSON. Also from near Tremadoc, Carnarvonshire, June, 1921.—G. C. DRUCE.

O. Fuchsii Druce. [1299]. Woodbury, near Exeter, v.-c. 3, damp places on border of a wood and ditches by roadside, June 23, 1921.—W. S. M. D'URBAN. "Yes."—DRUCE.

Habenaria albida Br. Hilly pasture, Nentsbury, near Alston, Cumberland, June 19 and 29, 1921.—C. WATERFALL.

Galanthus nivalis L. [1237]. Newport, Countess Wear, Exeter, S. Devon. Naturalised and in great profusion in a small wood, February, 1921.—W. S. M. D'URBAN.

Leucojum pulchellum Salisb. Brixton, Isle of Wight, April, 1921. See *Rep. B.E.C.* 317, 1921.—G. C. DRUCE.

Allium sibiricum L. Lizard Downs, W. Cornwall, June 7, 1921. —H. DOWNES.

Juncus effusus × *inflexus* (*Juncus diffusus* Hoppe). Ippolyts Common, Herts, August 3, 25, 28, 1921. This hybrid is noted in Pryor's *Flora of Herts* for a number of stations in the Lea basin, but has not been recorded for N. Herts nor apparently for Beds. I was led to search for it on the assumption that it ought to occur in some area where *Juncus effusus* and *Juncus inflexus* grow together in quantity, and although I failed in several places I was successful in two, *viz.*, this locality and at Radwell Mill. I do not see any reason why it should not also be found in Beds.—J. E. LITTLE.

J. subnodulosus Schultz. Dried up ditches near the sea, near Deal, Kent, July 28, 1921. Unusually tall plants.—H. E. FOX. "Correct."—RIDDELSDELL. Also from The Wilderness, Gresford, Denbighshire, July 21, 1921.—C. WATERFALL. "Correct."—DRUCE.

J. bufonius L., forma. Cornfield, Roath, Glamorgan, v.-c. 41, June, 1921.—A. E. WADE.

Luzula pilosa Willd. [1260 and 1342]. Heathy banks at burnside, alt. 280 ft., Westgeo, Overabist, Birsay, Mainland, Orkney, June 28, 1921, and heathy and mossy banks at a loch side, alt., 330 ft., Muckle Water, Rousay, Orkney, July 23, 1921. In both habitats plants in unripe fruit which may perhaps account for the seed-crest being straight. This gathering confirms the record for *Juncus pilosus* in Patrick Neill's *Tour through Orkney and Shetland* in the year 1804.—H. H. JOHNSTON.

Alisma ranunculoides L. Marsh by the sea, Borth, Cardigan, v.-c. 46, June 22, 1921.—L. CUMMING. "Yes; now put in genus *Echinodorus*."—DRUCE.

A. natans Buch. [507]. Lyn Padarn, Carnarvon, July, 1921.—F. ROBINSON. "Yes, *Elisma natans* Buch., from its well-known station."—DRUCE.

Potamogeton alpinus Balb. River Gowy, The Roman Bridges, near Chester, June 27, 1921.—C. WATERFALL. "A common Cheshire species."—BENNETT. Also from canal near Lancaster, v.-c. 60, June 2, 1921.—C. WATERFALL. "Yes."—PEARSALL. "The Lancashire specimens may be *alpinus*, but are only fit to burn."—BENNETT. "Mere scraps of what appears to be a very narrow-leaved form of this."—PEARSALL.

P. perpygmaeus Hagst., ined. Cahir River, Clare, September, 1921.—G. C. DRUCE. "Dr Hagström's name, I suppose, of the doubtful Irish *P. lanceolatus* of the Cahir River."—BENNETT. "An extremely interesting addition to our list."—PEARSALL.

P. lucens L. Muckle Water, Rousay, Orkney, alt., 323 ft., July 23, 1921 (plants in flower-bud), and August 22, 1921 (plants in full flower). Mr Bennett, to whom all my specimens were submitted, wrote to me on December 1, 1921, as follows:—"There is no doubt the whole of these specimens must be named *P. lucens* L. As a rule the leaves are narrower than the type specimens in the Linnean Herbarium. I have looked up my 76 specimens from all over the world where *lucens* occurs, and there is nothing that exactly matches your specimens."—H. H. JOHNSTON. "Very acceptable. Well prepared and characteristic specimens."—PEARSALL.

P. crispus L., var. *serratus* Huds. Pond, Filwood, Whitchurch, N. Somerset, April 21, 1921. No fruit this year, so cannot decide whether it is only a young state or a distinct variety.—IDA M. ROPER. "Beautiful specimens of this state which is quite frequent in the English lakes."—PEARSALL.

P. Friesii Ruprecht = *P. mucronatus* Schrad. Mud at bottom of water, Loch of Wasbister, Rousay, Orkney, July 19, 1921 (plants in full bloom), and August 18, 1921 (plants in flower and unripe fruit). Mr Bennett, to whom plants were submitted, writes as follows:—"Deep water form with less fascicles of leaves on the axils of the leaves than usual, and of a more slender habit in all parts from growing in deep water, I suppose."—H. H. JOHNSTON. "Correctly named; models of careful presentation."—PEARSALL. "Hagström uses the name *P. mucronatus* Schrad."—DRUCE.

Cyperus fuscus L. Peat ditch, Walton in Gordano, N. Somerset, August 13, 1921. See *Journ. Bot.* 93, 1901, and *Fl. Bristol* 613-4. After some years of scarcity the plant has again appeared profusely in the shallow water of ditches in the old locality. The whole of this gathering was taken from a square yard of ditch-bottom, some luxuriant tufts being readily separable into three or four specimens. —J. W. WHITE.

Scirpus sylvaticus L. Near South Newington, May 25, 1921. An uncommon plant in Oxfordshire.—H. J. RIDDELSDELL.

S. nanus Spreng. Pwllheli, near harbour, August 10, 1920.—J. E. GRIFFITH.

Schoenus nigricans L., var. *nanus* Lange. Moor at Unst, Shetland, July 20, 1921.—R. J. BURDON.

Carex riparia Curt., forma. By the Frome at Frampton Cotterell, W. Gloster, June 6, 1916. This plant corresponds well with a gathering made by Dr Druce at Yarnton, Oxon, in June 1915 and contributed to the Club. See *Rep. B.E.C.* 379, 1915.—J. W. WHITE.

C. acutiformis Ehrh., f. *monstroso*. Wytham, Berks, June, 1921.—G. C. DRUCE. "A very curious state of the species. Is it the *C. paludosa* Good., var. *composita*?"—BENNETT. "Yes: it is the so-called var. of Cariot, but it is a monstrous condition."—DRUCE.

C. ornithopoda Willd. Origin, dry rocky limestone slope, Fell End, Clouds, Wild Boar Fell, v.-c. 69, July, 1918. See *Rep. B.E.C.* 529, 1918. Cultivated in rock garden, Sedbergh, 1921. All the 16 specimens now sent are the product of one densely caespitose plant. —A. WILSON. Also from Cressbrook Dale, Derby, June, 1882. Coll. J. SIDEBOTHAM; comm. S. H. BICKHAM. "Found there by Mr Rogers in 1875."—BENNETT.

C. limosa L. Moor near Stepe, Dorset, June 18, 1921. Only known in a very few Dorset localities; happily plentiful in this one. A very graceful sedge, invariably growing in generally ungetatable, quaking bogs.—C. E. SALMON. "An additional station for the county, only one being given by Mansell-Pleydell in the *Flora of Dorset.*"—BENNETT.

C. gracilis Curt., var. *tricostata* (Fr.). Askham Bog, M.-W. York, July 31, 1921. In great quantity, fruiting this year four weeks before its normal time on account of the exceptionally dry season.—J. CRYER. "I scarcely think so. I miss the 8-rowed spikes and also the three prominent ribs on the fruit—so emphasised by Fries, and so well shown in Husnot (*Cyperaceae* t. viii., 6). These fruits seem ± five-ribbed. The erect spikes are a point in its favour but that is not enough."—SALMON. "This sedge was sent me by Mr Cryer in 1909 and I then named it *tricostata* (a name afterwards confirmed by Kükenthal). It is a curious growth with this sedge that the female spikes are so often tipped with male flowers. Boott in his *Carex*, t. 556, shows this, as does Andersson *Cyp. Scand.*, t. 5, fig. 55, 1849. Fries described this as a species in his *Mant.* iii., 152, 1842. If, as a variety, it would seem that Ascherson Fl. Brandeb., i., 776, 1864, is the reference. Kükenthal made it a sub-sp. *erecta* in Œst. Bot. Zeit., iii., 171, 1897. Mr Cryer's 1908 specimens are exactly represented by Andersson's figure."—BENNETT.

C. elongata L. Near Pyrford, Surrey, May 21, 1920.—W. BIDDISCOMBE. "A new station for this scarce Surrey sedge."—SALMON and BENNETT. "But Lady Davy showed it to me there previously."—DRUCE.

C. remota × *vulpina* (*axillaris* Good). Clay Lane, Chichester, June 4, 1921.—R. J. BURDON. "Yes; not uncommon in that neighbourhood."—SALMON. BENNETT and RIDDELSDELL agree.

C. contigua Hoppe. Hitchin, Herts, June and August, 1921.— J. E. LITTLE. "Yes."—SALMON and DRUCE. "*C. muricata* L., var. *vulgaris* Anders. = *C. muricata*, sub-sp. *macrocarpa* Neum." —BENNETT.

C. muricata L. (*Pairaei* F. Schultz). Near Bodorgan Station, Anglesey, June 11, 1920.—J. E. GRIFFITH. "Gathered rather young, but, I believe, correctly named."—SALMON. "*C. muricata* L., sub-sp. *microcarpa* Neum."—BENNETT. "Yes, I have already recorded *C. Pairaei* from this place, but the name, *C. muricata* L., should not be used for it. See *Rep. B.E.C.* 382, 1915."—DRUCE.

C. paniculata L. Oughton Head, Hitchin, Herts, v.-c. 20, June 30, July 15, 1921.—J. E. LITTLE. "Interesting because of the excellent state of the fruit, which can be compared with Mr Robinson's *C. paradoxa*. For a very interesting account of the differences between *C. paniculata*, *C. paradoxa*, and *C. diandra* see Crépin *Notes sur quel. pl. rares ou critiques de la Belgique* 123-136, fasc. 5, 1865."—BENNETT.

C. paradoxa Willd. Marsh, Great Hockham, Norfolk, v.-c. 28, June 20, 1921.—F. ROBINSON. "The glumes of some of the fruits on this specimen are very long, double the length or more of the fruit; "about the length of the fruit" is usually given. This Carex is spread over a wide space in this parish and the adjoining one of Stow Bedon."—BENNETT. "Yes; but I think a single culm scarcely constitutes a sheet for exchange purposes. Continental botanists set a good example as to what should be sent."—SALMON.

C. diandra Schrank. Scarning Fen, E. Norfolk, June 20, 1921.—F. ROBINSON. "Yes."—SALMON. "A slender state of the species, from a station not given in the *Flora of Norfolk* 158, 1914. Mr Robinson locates this in v.-c. 27, but Scarning is certainly in v.-c. 28, W. Norfolk."—BENNETT.

Digitaria humifusa Pers. Field near Heyshott Green, W. Sussex, October 2, 1919. This beautiful grass was extremely plentiful in a sandy field where it might almost be considered an agricultural pest—indeed, the farmer threatened to exterminate it. One can only hope he was unsuccessful! Apparently a new record for Sussex.—C. E. SALMON. "The *Panicum Ischaemum* Schreber occurred under similar conditions in the greatest profusion in Surrey. See *Rep. B.E.C.* 406, 1918."—DRUCE.

Setaria viridis Beauv. Garden weed, Colchester, N. Essex, August 23, 1921. Coll. J. E. HUNWICKE; comm. G. C. BROWN. "Yes."—DRUCE.

Anthoxanthum ordoratum L. f. Wood in narrow valley near Marple, Cheshire, May 14, 1921. This was much larger than the ordinary form about. It comes under var. *glabrescens* Cel. = *genuinum* Syme in the general sense. The glabrous sheath rules out sub-var. *silvaticum* A. & G.—R. S. ADAMSON.

Alopecurus bulbosus Gouan. Mud flats, Rumney Monmouthshire, v.-c. 35, June, 1921.—A. E. Wade.

Agrostis retrofacta Willd. Waste ground, Bradford, M.-W. York, in great quantity, September 24, 1921.—J. Cryer.

Polypogon monspeliensis Desf. Edge of brackish pond by sea-wall, Thorney, W. Sussex, September 4, 1920. Also sandy edge of lake, Studland, Dorset, June 27. 1921. The Studland plants are very much smaller than those from Thorney, probably due, to some extent, to earlier gathering, but I feel sure this is not the chief cause. The withered remains at Studland were all those of small plants.—E. B. Bishop.

Deyeuxia neglecta Kunth. Great Hockham, W. Norfolk, June 20, 1921.—F. Robinson.

Gastridium lendigerum Beauv. Cornfield, Langton Matravers, Dorset, June 26, 1921. Coll. Mrs C. L. Wilde; comm. E. B. Bishop. "Right. Here doubtless introduced."—Riddelsdell. "The correct name is *G. ventricosum* Schinz and Thell."—Druce.

Avena pratensis L. Wigginton, Oxon, June 20, 1921. In a very wet, rushy field, on ground raised only some few inches above the wettest parts, with *Kœleria britannica*.—H. J. Riddelsdell.

Phragmites vulgaris Lam., var. *flavescens* (Custer) Druce. Mallow, Cork, September, 1921.—G. C. Druce.

Koeleria cristata Pers. Cliffs, north of Peel, Isle of Man, June 6, 1920.—J. A. Wheldon.

K. gracilis Pers., var. *britannica* Domin. Waste ground, near the coast, Lizard, W. Cornwall, June 7. 1921.—H. Downes. Also near Wigginton, Oxon, June 20, 1921. In a very wet, rushy field, on ground raised only some few inches above the wettest parts, with *Avena pratensis*.—H. J. Riddelsdell.

Briza minor L. Cornfield, Redcliffe, near Wareham, Dorset, June 11, 1921. Coll. Mrs C. L. Wilde; comm. E. B. Bishop.

Glyceria distans Wahl. By the Bristol Channel, near Avonmouth, W. Gloster, July 10, 1907.—J. W. White.

Bromus commutatus Schrad. Roadside, Layer-de-la-Haye. N. Essex, June 12, 1921.—G. C. Brown.

B. racemosus L. Waste ground, Hatchmere, Cheshire, June 15, 1921. I have known this on this spot for the last four years. The plants are very small sized owing to the drought.—R. S. Adamson.

B. mollis L., var. Edge of cultivated field, on limestone soil, near Taddington, Derbyshire, May 26, 1921.—R. S. ADAMSON. "A form of *B. hordeaceus* L., for which I know no special name."—DRUCE.

B. hordeaceus L., var. *Thominii* Asch. & Graeb. Sandy shore, East Mersea, N. Essex, v.-c. 19, June 12, 1921. I sent a few sheets of this plant to the Club in 1912, and it was named as above by Prof. E. Hackel.—G. C. BROWN.

Equisetum arvense L., var. *nemorosum* Braun. Walton, S. Lancs, July 28, 1921. This variety seems to be dependent on shade. It grew under trees on the shady side of a fence. On the sunny side of the latter there was an abrupt transition to the ordinary plant, with short, dense branches, and procumbent stems, and in one instance some of the latter were traced at a depth of 18 inches to be connected with the tall erect "*nemorosum*" condition.—J. A. WHELDON.

Lastrea spinulosa Presl. Oughton Head, Hitchin, Herts, v.-c. 20, June 30, July 15, 1921. *L. spinulosa* has not hitherto been recorded for Oughton Head. In Pryor's *Fl. of Herts*, under *Aspidium dilatatum* Sm., Hitchin Common = Oughton Head is given. The drought of this year has enabled me to make an extended exploration of this bog, which is usually unapproachable. As a result, although I found luxuriant *L. spinulosa* and some apparent intermediates with discolorous, acute, lanceolate scales, dark green fronds, but indusium not glandular-ciliate, I am not sure about the occurrence of undoubted *L. aristata* R. & B., although I have found it in a new station at St Ippolyts, about three miles distant.—J. E. LITTLE.

L. spinulosa Presl, var. Ashley Heath, Loggerheads, 1½ miles east of Blue Heath, Staffordshire, v.-c. 39, August 27, 1921.—J. COSMO MELVILL. The caudex of this fern, forma vel var., was very dense, and the fronds with their strong-growing pinnules recurved, rendered it almost impossible to lay out properly. It appears to me to approach *L. aristata* R. & B. (=*dilatata* Presl), through its narrow variety *collina* Newman. The usual form in Shropshire seems to be of the *uliginosa* alliance, growing on damp peaty soil. I have never seen anything from Great Britain with the pinnules so finely cut as is found in the variety *intermedia* Presl from the United States, although the variety *polydactyla* of *dilatata*, as collected and named by W. J. M. Barnes, from Withersback, Westmoreland, to some extent approaches it.—J. COSMO MELVILL. "This closely resembles one sent in 1901 as *L. spinulosa*, var. *glandulosa* (Moore). It seems as near to *L. spinulosa* as to *L. dilatata*, though Moore described his plant as a var. of *L. dilatata*. It differs from typical *L. spinulosa* in outline of frond, and in the indusium being more dentate and, when young, very distinctly ciliate with stalked glands. Mr Bennett thought it did not agree with *Lophodium glandulosum* of Newman, which Syme thought to be *L. spinulosa* × *dilatata*. Whatever its true name and origin, it is one of the intermediates between these two usually well-marked species."—WHELDON.

Aspidium spinulosum Sw. (*Lastrea spinulosa* Presl). On the peat moor near Catcot-Burtle, N. Somerset, August 28, 1888.—J. W. WHITE. "These three gatherings are *Dryopteris spinulosa* Kuntze."—DRUCE.

Isoetes lacustris L. Mud at bottom of water, 7 ft. deep, in a loch, alt., 328 ft., Peerie Water, Rousay, Orkney, August 22, 1921. —H. H. JOHNSTON. Native. Common in the deepest parts of the loch, where the bottom is muddy, but I found no plants of this species growing on the stony bottom of the shallow water along the margin of the loch where flowerless plants of *Littorella uniflora* Aschers. (=*L. lacustris* L.) grow in abundance. My boatman informed me that in autumn large quantities of the leaves, which become detached from the plants, are washed up on the shore of Peerie Water, and that wild ducks greedily feed on them.—H. H. JOHNSTON.

Selaginella denticulata Link. Alien, apparently becoming wild. Well established in an orchard, Landewednack, Lizard, Cornwall, June 7. 1921.—H. DOWNES. "A new alien."—DRUCE.

Nitella opaca Ag., nov. var. Asta Loch, Shetland, August, 1921. —G. C. DRUCE. "A well-marked lake form of *N. opaca* which Canon Bullock-Webster and I have seen from several localities, and of which we hope soon to publish a description."—GROVES. "Yes. See *Rep. B.E.C.* 162, 1920. It seems worthy of varietal distinction."—DRUCE.

Tolypella nidifica Leonhardi (fide James Groves). Mud at bottom of brackish water, 4 ft. deep, in a loch at sea level, Loch of Stenness, Nether Bigging, Stenness, Mainland, Orkney, August 9, 1921. Plants in full fructification and growing among *Chara canescens* Lois. In *The British Charophyta* by Groves and Bullock-Webster i., 137, 1920, *Tolypella glomerata* Leonh. is recorded from Orkney, and Mr James Groves, F.L.S., *in litt.*, dated November 1, 1920, informs me that this record rested on a scrap of *Tolypella* without mature fruit, collected by Mr A. H. Evans in the Loch of Stenness in 1911, but that now he is inclined to think it may be immature *T. nidifica* Leonh. On August 2, 1920, Dr G. C. Druce, Prebendary R. J. Burdon, and I, when searching for *Chara baltica*

Bruzel in the Loch of Stenness, raked up plants of *Chara canescens* Lois. and *Tolypella nidifica* Leonh. (fide James Groves), and these two species are recorded by Dr G. C. Druce in *Rep. B.E.C.* 730, 1919. I am indebted to Mr James Groves for drying the fifteen sheets of *T. nidifica* Leonh. collected by me on August 9, 1921, and sent to the Club for distribution.—H. H. JOHNSTON. "See *Rep. B.E.C.* 163, 1920. I also found it in 1921 in Dunrossness, Shetland, as a much smaller plant."—DRUCE.

Chara desmacantha (Groves). Loch Tingwall, Shetland, July 21, 1921.—R. J. BURDON. "A well-marked lake form of *C. delicatula* Ag., characterised by its dwarf, densely tufted habit, stout stem, and crowded whorls of stout, incurved branchlets."—GROVES. "Yes; we also obtained it in 1920 from Tingwall, and I think it deserves a distinctive name. See *Rep. B.E.C.* 163, 1920."—DRUCE.

NOTE ON DISTRIBUTOR'S REPORT, 1920.

Mr Pugsley questions the naming, *Hieracium serratifrons* Almq., var. *Stenstroemii* Dahlst., and *H. Adlerzii* Almq., which I sent to the Club. The former is a well-known West Riding plant. All the stations named for it in Linton's *Monograph*, p. 45, are in that v.-c. The Rev. A. Ley gives eight stations and other places in Wharfedale (*Journ. Bot.* 14, 1909). Mr Hanbury collected it there in 1891 and the late Revs. A. Ley and W. R. Linton collected it in many stations in 1900 and 1904. In 1910 I collected many plants and submitted them to the Rev. A. Ley, who named them as above. In 1913 and 1914 I made further collections and submitted them twice to the Rev. E. F. Linton, who wrote:—"Seems to me *H. serratifrons* Almq., var. *Stenstroemii* Dahlst., on both occasions. It cannot be *H. virale*, which has grey heads and is a rare plant in Yorkshire. Mine has black heads, densely glandular, and practically epilose."

H. Adlerzii Almq. was gathered by me at the identical station where Mr J. E. Griffith first found it in July 1891. I had the pleasure of seeing and examining his original, and mine were identical in every detail.

Mr Hanbury (*Notes on British Hieracia* 5, 1894) says: "leaves characteristically toothed towards the base." Babington, *Manual*, ed. ix., p. 255, says: "leaves with large, irregular spreading teeth, hairy or glabrous above." and Linton (*l.c.*, p. 68) says: "leaves with two to three broad, triangular teeth on the sides.

There is no doubt in my opinion that both plants are correctly named.—J. CRYER.

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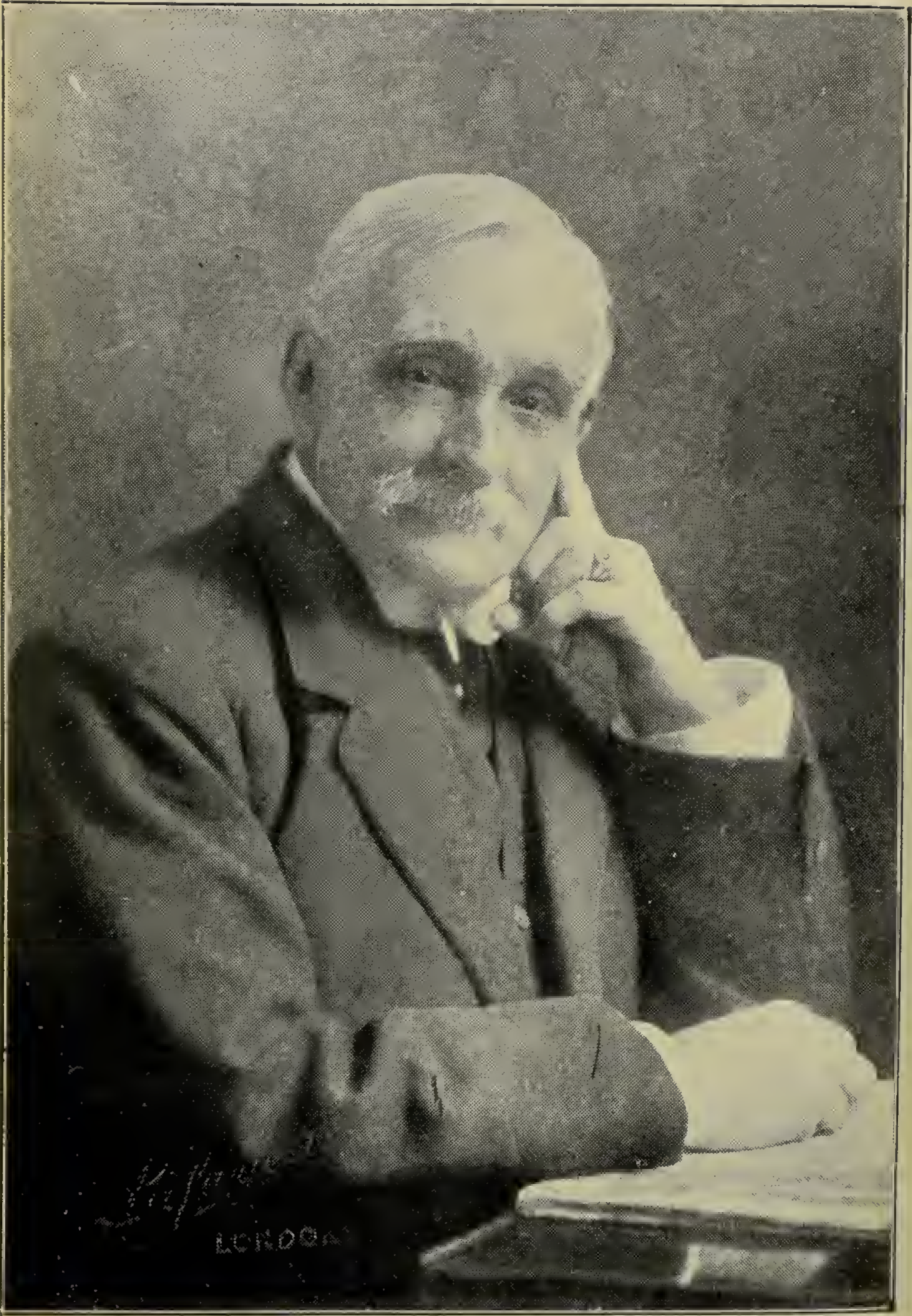

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The Exchange Members are grateful to Miss E. N. Thomas, D.Sc., Miss Vachell, F.L.S., and Mr A. E. Wade for editing the Exchange Club *Report* and distributing the 4836 specimens collected in 1921.

The present season has not been a favourable one for the Field Botanist. The dry and hot early June threatened another drought but the rain soon came in too great quantity, and over too long a period. The cold temperature in Scotland, too, was inimical. Probably, however, no year has witnessed such a copious and magnificent display of Hawthorn blossom in our hedgerows, and the subsequent crop of haws was equally profuse. The fruit of the *Rhamnus cathartica*, *Ligustrum vulgare*, *Sambucus nigra*, and *Euonymus* were also in splendid show. The fruits of the Beech, Lime, Maple, and Hornbeam were produced in such plenty as I have never seen before. Mr W. H. St Quintin, writing from E. Yorkshire, said :—"We have a greater crop of Beech Mast than anybody can recollect; branches of trees weighed down and even broken by the masses of fruit. Some individual Oaks also very heavily laden but neither Sloes or Bullace seem to have set fruit." Doubtless the hot summer of the previous years was the primary cause of this wealth of blossom and fruit in our shrubs and trees.

We have no new Linnean species to chronicle this year such as *Tillaea aquatica* which was discovered in Yorkshire by Mr Butcher in 1921. There are, however, some interesting extensions of range in plants to record—notably *Poa bulbosa* and its var. *vivipara* from Pontac, Jersey, where Lady Davy found it. She also has found *Habenaria virescens* in Jersey which is practically a new record. Mr Christopher Cookson also found *Romulea* in Gower, a new plant to the Principality. I am grateful to Mr T. Gambier Parry for allowing me to have the specimen. *Phyteuma spicata*—as the blue-flowered form—was found in a pasture near Dolgelly, Merioneth, by Mrs Richards. We await further investigation as to its history. Miss Todd has now definitely discovered *Fumaria muralis* near Mevagissey, Cornwall. The name is verified by Mr Pugsley. Last year Mr J. E. Little found *Alnus incana* near Hitchin, but it appears likely to have been planted there. This year the Rev. W. Wright Mason brought me some plants to examine and among them was a specimen, much more like the Norwegian examples, which he gathered near Melmerby in Cumberland two years ago. It is the Common Alder of Norway and hybridises with *glutinosa*. Last September Mrs Wedgwood and I visited Galway, Clare and Kerry. In addition to the interesting hybrid of *P.*

coloratus and *pusillus* which is the old *P. lanceolatus*, var. *hibernicus* of the *List* we added a new Pondweed to the British Isles, *i.e.*, *P. Seemenii*, a hybrid of *polygonifolius* and *gramineus.* In Jersey I was fortunate enough to add another new hybrid, namely, *P. spathulatus* Schrad., and from Spiggie, Shetland, a new form of *P. nitens*, *i.e.*, *flumineus* Hagstr. Mr Thurston has found what seems to be a new variety of *Serratula tinctoria* in Cornwall, and he has also sent me from Biscovey an entire-leaved form of *Crepis taraxacifolia* which Miss Trower and I also found at Ware this year and which I am naming var. *subindivisa.* Mr John Cryer has found several new Aliens near Bradfield. Several espartal Aliens from Leith have been added by Mr John Fraser. We much regret his health-breakdown and trust he may soon recover. Mr Grierson has added some also from the Glasgow area, and Mr R. Smith has found several South European species near Radyr, Glamorgan. The means of the introduction of the South European species is somewhat uncertain although they are supposed to be carinal, *i.e.*, ballast plants, but I am assured no ballast is now brought there.

Death has been busy in our midst and has robbed our ranks of that veteran, hard-working, field botanist, the Rev. E. A. Woodruffe-Peacock, an original investigator and patient accumulator of details of plant-occurrences in Lincolnshire—a real pioneer in ecology. Viscount Bryce, eminent in so many ways, who wrote a Flora of the Isle of Arran so long ago as 1859; Canon John Vaughan of Winchester, a genial and elegant scholar; the many-sided and brilliant speaker and enthusiastic horticulturist, Viscount Harcourt; Mr A. S. Montgomrey, who died at Trowbridge in April; Mrs Grey, of Peppard, who died in the south of France; Mrs Berkeley, of Spetchley Park, a devoted friend of the poor and a talented gardener; Richard L. Burton, of Longner Park, Salop, a very successful cultivator of the British Orchids, and a great book-lover; and Mr Albert Ernest Hall of Cranfield House, Southwell, have passed from our midst. Dr J. Hagström, of Sweden, one of our most valued Honorary Members, died on the seventh of June, never having recovered from an operation he underwent. He was the recognised authority on the Pondweeds of Europe. His brilliant suggestion about the origin of the Hibernian *Potamogeton lanceolatus* has been alluded to in our *Report*. We were enabled to gather the second parent *coloratus* growing with it, and this verification of his suggestion came to him on his bed of sickness and was most grateful to him.

Outside our ranks the botanical world has lost Mr Carruthers who for many years was the Keeper of the Botanical Department of the British Museum; Professor G. S. Boulger, who compiled several botanical works and was a Lecturer at the City of London College; Professor W. B. Bottomley, who so short a while ago relinquished the Chair at King's College; Mr J. F. Duthie, who did some good work at the Indian Flora; Prof. Sir I. B. Balfour, a most distinguished member; the eminent French botanist, Prof. Bonnier, and others.

We offer our sincere congratulations to our veteran member, Lord Leverhulme, on his promotion to a Viscounty; to the Hon. Mrs Mildmay on the elevation of Colonel Mildmay to the peerage; to the Sherardian Professor of Botany, Dr F. Keeble, and to Dr E. J. Russell, of Rothampsted, on their knighthoods, also to Prof. J. B. Farmer on his Edinburgh degree of LL.D.

Our foreign experts have, as usual, been most kind. We are greatly indebted to Dr Albert Thellung of Zurich for his splendid help; to Dr E. Almquist for identifications of the Shepherd's Purses, some being new to Britain; to Dr J. Murr for examining the Chenopods; to Mr H. Dahlstedt for examining our Dandelions, and for the diagnoses of several species new to science. Prof. C. H. Ostenfeld, the lamented Dr J. Hagström, and Prof. Holmboe have also rendered assistance. We are very grateful for the literary help given by Dr S. H. Vines, F.R.S.; T. R. Gambier-Parry, M.A.; and Rev. F. Bennett, M.A., and to Mr and Mrs Corstorphine for their help in the arduous task of proof-reading.

The membership, large as it is, we should like to see increased, since the loss by deaths, etc., is very large. The experience of most Societies is that there is about a ten per cent. annual loss in membership; so that we in our Society need over fifty new members each year to make up the deficiency.

Our new members include:—The Right Hon. H. Baker, Miss E. M. Blake, W. Biddiscombe, *C. J. Bond, M.R.C.S.; *Mrs Bowlby, Miss Ruth Bright, Miss Barbara Buckler, the Countess Buxton, J. Campbell, the Countess of Carlisle, F. Clarke, R. B. Cooke, Miss

David, F. M. Day, J. H. Dixon, *W. Evans, *Mrs Sanderson-Furniss, J.P.; H. J. Gibbons, A. J. Gibson, M.D.; Sir Rickman Godlee, K.C.V.O.; Captain A. W. Hill, D.Sc., F.R.S.; C. E. Hodgkin, Dr J. Holmboe, J. A. Holmes, *Rev. S. Laing, M.A., Mr Luddington, The Melbourne Library, The Viscountess Northcliffe, Dr J. Parkin, Faculté de Pharmacie de Paris, J. Pickard, B. Reynolds, Mrs Richards, *J. Rose, M.A.; R. J. Ryle, M.D.; the Baron Bruno Schroeder, H. K. Airy Shaw, W. Shaw, W. Simpson, N. Douglas Simpson, South London Botanical Institute, R. Snow, B.A.; Dr O. Stapf, Mrs Stokes, C. B. Tahourdin, Miss Ethel Thomas, D.Sc.; W. A. Todd, Professor Troup, Sir H. J. Veitch, Miss Elsie Watchorn, M.P.S., W. Van de Weyer, and W. C. Worsdell. (* signifies joined in 1923.)

This year I have been able to send to Louvain for the Botanical Department of the University nearly three thousand sheets of labelled British plants as our offering, and as a token of our sympathy in their loss. Mr C. Bailey, Mr J. E. Little, and the Secretary were the chief contributors. The carriage has rather swollen our expenses. The Rector of the University, Dr Ladeuze, has sent a very grateful letter in acknowledgment.

My own work at British plants suffered owing to my absence from England for a month in the spring, when Avignon was visited. Then it was more than usually picturesque owing to the immense floods in the Rivers Rhone and Durance, which had swollen to lake-like dimensions. It was sunny enough when we were there, and the clear atmosphere brought very near to us Mont Ventoux and Carpentras, the scene of Fabre's historic researches into the mysteries of insect-life. At Mentone it was rather cold and dull, and the only fresh plant seen was the pretty *Leucojum hiemale* which, unlike *vernum* and *aestivum*, delights in arid spots. At Florence and Pisa it was bitterly cold, but a more genial temperature, chequered with heavy thunder-storms, met us at Perugia, a lovely place amid pleasant surroundings. In the Umbrian plain, near Assisi, grew a yellow-flowered *Polygala*, the local *P. flavescens*, associated with *Orchis Simia* and *purpurea*. My Italian visit was made primarily to see the Herbarium of Aldrovandi at Bologna, and a separate note on it will be found in another part of this *Report*. We returned to Britain by Mont Cenis, Paris, and

Havre. In June a fortnight was spent in Holland, when I greatly enjoyed the hospitality of the Isle of Walcheren, of the Hague, Haarlem, Leyden, Delft, Rotterdam, and Amsterdam, so generously given us by those places. We stayed for some time at the Grand Hotel at Scheveningen, from which we were taken in motors over a considerable part of the country, but little time was allowed to the botanist. The dunes were covered in places with *Polygonum multiflorum*, growing with *Asparagus*, a somewhat curious habitat for a woodland species. There, too, grew the English *Sedum*, which Graebner named after me. *Silene Otites* was not uncommon, and *Bromus tectorum* was frequent along the railways. *Matricaria suaveolens* has established itself, and in marshes we saw *Orchis praetermissa*. The ditches had an abundance of *Stratiotes*, *Butomus* and *Hydrocharis*. Then five weeks in July and August—a great slice out of a poor summer—were spent in Norway. In March I visited Stogumber, under Mr Miller's guidance, to see the station of *Leucojum vernum*. It looks wild as it grows with *Chrysosplenium alternifolium*. The extent, however, is very limited, and it is therefore difficult to decide upon its indigenity. In May, with Miss Trower, Cherry Hinton was visited, and in Herts, at Gilston Park, the seat of Mr Bowlby, we found some good tufts of *Carex elata*. Later we noticed other clumps near Broxbourn Woods, so that it cannot be so rare as is suggested in the *Flora of Herts*. At Ware we found a new variety of *Papaver Argemone*, and another of *Crepis taraxacifolia*. A visit to Ray Island in Essex was also made. In June I stayed at Newtimber, and Lady Buxton took me to St Leonard's Forest, where we saw *Melittis* in beautiful flower, and, in a hedge near Albourne, where it has been known for over half-a-century, *Lathyrus odoratus*. Then I went to Chichester, and, with Prebendary Burdon, explored Hayling Island, where Miss Hillard guided us to *Cynosurus echinatus*, which has appeared there recently. We saw *Orchis hircina* near Goodwood. In July I went to Patshull, and, despite the inclement weather, Lady Dartmouth took me to Bridgnorth, Much Wenlock, and Buildwas Abbey. Near the Abbey grew *Scrophularia alata, Orchis O'Kellyi*, and, quite naturally near Patshull, *Geranium Endressi*. Later I went to Sir Roger Curtis' at Lichfield, and in dreadful weather explored Needwood Forest with poor results. With Father Reader and my host we went to see what was once a saline area in Staffordshire, but it contains now no maritime species. *Potamogeton Lintoni* and *P. Cooperi* still grow in the canal at Lichfield, dirty though it is. In September Essex was visited and *Mentha alopecuroides* was noticed at Little Maplestead and *Filago gallica* in its old station at Berechurch. A rapid journey was made from Byfleet to the New Forest with Lady Davy and Mr Williamson, and *Ludwigia* and *Pinguicula lusitanica* were both seen in flower. In October I stayed at Westonbirt to see the splendid display of autumnal tints in the foliage of the wonderful collection in Sir George Holford's Arboretum and grounds where the catalogue, which Mr A. B. Jackson is preparing, contains already about 1800 names. Not only is there an enormous variety but the individual specimens are so fine and so tastefully arranged that I suppose elsewhere in the world there is no such display. To see a Japanese Maple in its soft orange-red glories backed up by the lucent green pillars of *Cupressus macrocarpa* or the dainty loveliness of *Cercidophyllum japonicum* against a background of sombre pines is a memory that will long remain. Nor are the glories of Westonbirt limited to the Arbores. There was about a quarter of an acre of *Campanula patula* and in the 27 Orchid houses were some of the finest Orchids of their race. It is not everyday of one's life that one can sit on a sixteenth century Pope's throne from the Strozzi Palace and warm oneself at a fire of Mexican pine-cones, while two of the finest Rembrandt's in Britain look down upon one from the walls. Just as the richness of the background of *Cupressus* is to the *Cercidophyllum* or the *Acer*, so too, to these objects of interest and beauty, is the kindness of Sir George and Lady Holford. As late as November I was enabled to show the Misses Cobbe *Stachys germanica* and *Sisymbrium Irio* in flower, and in the same month Mr Noel Sandwith took me to see *Filago spathulata* and *apiculata* also in flower in Berkshire.

PLANT NOTES, Etc., FOR 1922.

(*Mostly New Plants to the British Isles, or Notes on British Species inserted here for convenience of reference.*)

Abbreviations.—† before name signifies the plant is not native; × = a hybrid; ! after a locality, that the Secretary has seen the plant there; brackets [ ] that the plant is not British or the record is doubtful; *Ann. Bot.* = *Annals of Botany*; *Bot. Abstr.* = *Botanical Abstracts*; *Gard. Chron.* = *Gardeners' Chronicle*; *Ir. Nat.* = *Irish Naturalist*; *Journ. Bot.* = *Journal of Botany*; *Nat.* = *Naturalist.*

9. Anemone nemorosa L., var. marginata J. Henriksson in *Bot. Not.* 103, 1922.

Ranunculus, Fossil. In an interesting letter to *Nature* (136, 1922) Eleanor M. Reid mentions that the oldest carpel she has seen belongs to *Ranunculus galiensis* from the base of the Pleiocene at Pont de Gail, Cantal, where, in another locality, a second species closely related to *R. fluitans* occurs, the *R. atavorum* Sap. In the latest Pleiocene of the Cromer Forest-bed all are British species save two undetermined carpels. In the Middle Pleiocene of Castle Eden a form of *R. sceleratus* is found.

48. Caltha palustris L., var. parviflora F. Gerard Notes, p. 6. Under this probably come some plants sent by Mr G. C. Brown from Newton-by-Castleacre, W. Norfolk, in 1921 [Ref. No. 1886], which he referred to var. *minor* DC., but that plant is decumbent. To *parviflora* probably goes Mr Riddelsdell's plant from Penyfae, Glamorgan, although that has a procumbent habit. Both plants are worth cultivating.

54. Aquilegia vulgaris L., forma monstrosa. Miss Robinson sent me a specimen from St Leonards Forest, Sussex, in 1922, in which the floral organs were abortive or foliaceous. The upper

bracts, too, were simply trifoliate, with entire margins. Subsequently, with the Countess Buxton, the habitat was visited, but it appears to have been a solitary example of an accidental monstrosity.

67*b*. ACONITUM CAMMARUM L., var. STOERKIANUM (Reichb.). Alien, Europe. Hortal. On rubbish at sea-shore, Hamis Voe, Stromness, Orkney, 1920. H. H. JOHNSTON in *Trans. Bot. Soc. Edin.* 53, 1921.

81. PAPAVER DUBIUM L., Meristic variation in. T. A. SPRAGUE in *Journ. Bot.* 299, 1922.

83. P. ARGEMONE L., var. CONTIGUA, nov. var. On rubbish heaps near Ware, Herts, June 1922. This differs from type *Argemone* by having much larger, broader petals which overlap and are of a deep crimson colour (as in *hybridum*, but slightly darker), with a dark blotch at the base. There is no sign of hybridity with *hybridum* as the capsule is normal *Argemone*, and the leaves, too, are similar to the type. It is probably of foreign origin since it grew with other European or Eastern plants. I am unable to match it in our National or Oxford Herbaria. In Fedde's Monograph (*Das Pflanzenreich* 328) a *P. Virchowii* Aach. & Sinten. It. Trojanum 37, 1883, is described, which also has petala ' late. obovata,' but that differs in essential characters and, therefore, I prefer to leave the plant as a variety of *Argemone*. G. C. DRUCE.

86 (3). P. ORIENTALE L. Alien. Orient. Hortal. Waste ground, Dundee, Forfar; Bullingdon, Oxon. G. C. DRUCE.

98 (3). CAPNORCHIS SPECTABILIS (L.) Borck. *Fumaria spectabilis* L. *Dicentra spectabilis* Ch. Lem. in Pl. des Serres iii., t. 258, 1847. *Diclytra spectabilis* DC. Syst. ii., 110. 1821. Alien. Hortal. This elegant Japanese and Siberian plant, which has been in cultivation in Britain since 1816, was noticed by Lady Charles Bentinck this year as rampant in the woods of Brogyntyn, the seat of Lord Harlech, near Oswestry in Shropshire. The oldest name for the genus is *Capnorchis*, which was given it by Miller (*Abr. Garden. Dict.* 1754), with one species, *C. americana*. This binomial

is accidental since Miller in this edition does not consistently follow the binomial system. Later, in 1763, Adanson (*Fam. des Plantes* ii., 23) called it *Bikukulla*, which Jussieu (*Steud. Nom.* ed. 2, i., 202) changed to *Bicucullaria*, with a species *B. canadensis*. In the *American Check-List* of 1893 Adanson's name is adopted but the spelling varied to *Bicuculla*. In 1808 Rafinesque (*Med. Repos. New York*, v., 352) gave it the name *Cucularia*, which is written *Cucullaria* by Endlicher in his *Genera* of 1839. Rafinesque in his *Catalogue* of 1824 used the name *Diclythra*, a variant of Borckhausen's *Diclytra*, which he established in Roemer's *Archives* i., 46, 1797. Again, another spelling, *Dieclytra*, often followed by horticulturists, was given by Chamisso and Schlechtendal (*Linnaea* i., 556, 1826). De Candolle (*Syst.* ii., 108, 1821) called our plant *Diclytra spectabilis*, taking the specific name from Linnaeus' *Fumaria spectabilis* (*Sp. Pl.* 699, 1753). Yet, notwithstanding the existence of two much older names, the *Index Kewensis* gives as the valid generic name *Dicentra*, which only dates from 1833 (Bernh. in *Linnaea* viii., 457). On the ground of priority *Capnorchis* Miller unquestionably holds the field since in 1754 Miller restored the name given it by Boerhaave, the great Leyden botanist, in 1720. Fortunately there are few species in the genus so, if *Capnorchis* is, as it ought to be, adopted, little inconvenience will arise. As escapes from cultivation *Capnorchis formosa* (Walp.) Planch. and *Cucullaria canadensis* have been recorded in our *Reports*.

108. FUMARIA MURALIS Sonder. The true plant has been found by Miss TODD near Caerhayes, Cornwall, where Mr Pugsley has seen it in situ. It is satisfactory to have the true plant now authenticated as British. The old records of *muralis* are untrustworthy, forms of *F. Boraei* and other species being mistaken for the plant of Sonder.

143. CARDAMINE AMARA L., forma PARVIFLORA W. & G. To this Dr Thellung refers a plant which grows in the meadows near Loddon Bridge in Berkshire. The flowers are quite small. In was found there by Mr J. W. HIGGENS in 1917. It was thought by some botanists to be a hybrid.

181. SISYMBRIUM STRICTISSIMUM L., which has appeared as an

alien on the Mersey banks in Lancashire and Cheshire (*Rep. B.E.C.* 538, 1897), and in the Magdalen College Gardens at Oxford (*Rep. B.E.C.* 638, 1919), is strongly recommended by J. van Laren, of Amsterdam, as a fine border plant. Our member, the Rev. Prebendary H. E. Fox, has recently distributed it through the Club (*Rep. B.E.C.* 551, 1921).

216. BRASSICA ARVENSIS Kuntze, forma OCHROLEUCA. On the Churn-downs, Berkshire, growing with typical Charlock, were a few plants with whitish-yellow flowers, but the leaves showed no signs of albinism. G. C. DRUCE.

232. BURSA PASTORIS Weber. Three new British species. Dr E. Almquist has named a *Capsella* which under Mott's Arrangement would come under *densiflora* as being close to his C. ORIGO. It grew on the site of an aerodrome at Oxford. BURSA INCLINATA (E. At.). Growing on waste ground at Port Meadow, Oxford. BURSA MEDITERRANEA (*Rep. B.E.C.* 196, 1920), but without a British locality. I am now able to supply one from Carmarthen, June 1920. This year I also gathered it at Avignon and Bologna.

239. LEPIDIUM PERFOLIATUM L., Apropos du. G. Nicolas in Bull. Soc. Bot. France 401, 1921.

247 (13). L. HYSSOPIFOLIUM Desv., var. INTEGERRIMUM Thell. Alien, Bradford, Yorks, 1919. J. CRYER.

247 (31). L. DESVAUXII Thell., var. GRACILESCENS Thell. Alien, Bradford, Yorks, 1921, J. CRYER. An Australian species which appears in Britain under this modification.

358. LYCHNIS FLOS-CUCULI L., forma NANA. Isle of Stroma, Caithness, W. MANSON, ex A. TEMPLEMAN. A singular plant (forma *nana* mihi), dwarfed to two inches high with a single flower and green calyx-ribs. Experimental culture needed to see if the characters are permanent or if it is merely a state due to wind exposure. Mr Manson says it grows " in the thin layer of soil and harsh grass that manages to exist and is green in summer on that wind and spray-swept surface."

370. CERASTIUM VULGATUM L., var. HOLOSTEOIDES (Fr.), as a species. Mr F. N. Williams (*Journ. Bot.* 74, 1922) has a note on this plant with a description. Other species of *Cerastium* are also dealt with in this paper.

398. ARENARIA SEDOIDES (Kit.). As a shingle-plant in several large clumps at Montrose, Forfar, R. H. CORSTORPHINE. I have never previously heard of its occurrence at the sea-level in Scotland. The lowest station I know of is at 700 feet in Perth. I gathered it at 1800 feet on Slioch. Although recorded for Unst, doubtless *Silene acaulis* was mistaken for it.

410. SPERGULA SATIVA Boenn. Under the title of "Growth Experiments on *Spergula* and *Plantago*" B. MILLARD GRIFFITHS, M.Sc., in *Journ. Bot.* gives the results of growing plants from seeds of *Spergula arvensis* and *S. sativa* collected at Kewaigue in the Isle of Man. Papillate seeds produced only *S. arvensis*, non-papillate seeds only *S. sativa*, and the conclusion arrived at—and with which I completely agree—is that they "are clearly of specific rank and not varieties." In the *Flora of Berkshire* 101, 1897, I said that the characters are not changed by cultivation for I had grown both by seed. Vegetatively, too, they show differences and, although sometimes they grow together, their geographical distribution differs, *S. arvensis* being the southern while *S. sativa* is the more northern plant. Nor do they appear to hybridise.

436. HYPERICUM PERFORATUM L., forma (lusus) SESSILIFLORUM. This is a curious, lax, branching plant with sessile solitary flowers in the axils of the upper pair of branches. It was found near the Electricity Works, Malvern, Worcester, in 1921, by Mr F. J. Wall. The central stem seems to have been broken off. The plant is about nine inches high. G. C. DRUCE.

459 (2). SIDA CORDIFOLIA L. Alien, tropics. Near the Oil Mills, Hull, Yorks, 1922, Miss M. COBBE.

.468. LINUM USITATISSIMUM L., Recherches sur les hybrides du. L. Blaringhem in *C. R. Acad. Sc. Paris* 329, 1921.

509 (3). OXALIS LATIFOLIA H. B. K. Alien, Mexico. Hortal.

A troublesome weed in cultivated ground, Penzance, Cornwall, 1921, E. THURSTON.

526. ACER CAMPESTRE L., var. INCISIFOLIA Druce. Leaves deeply cut into lobes, to within $\frac{1}{4}$ to $\frac{1}{2}$ inch of the peduncle; samaras downy. Near Eastbourne, Sussex; near Princes Risborough, Bucks; Hemel Hempstead, Herts. See also *Rep. B.E.C.* iv., 562; v., 646; vi., 378.

526. A. CAMPESTRE L., var. HEBECARPUM DC., sub-var. PURPURASCENS Legr. Fl. Berry, ed. 2, 63. ‘Fruits mûrs rouges.’ See Rouy & Fouc. *Fl. Fr.* iv., 151. Chinnor, etc., Oxon. Specimens distributed this year.

Var. LEIOCARPON Wallroth, sub-var. RUBESCENS mihi. Princes Risborough, Bucks [Ref. No. 27059]; Chinnor, Oxon, etc. Samaras strongly veined, bright crimson-red. G. C. DRUCE.

533. GENISTA ANGLICA L., var. SUBINERMIS Rouy & Fouc. Fl. Fr. iv., 227, 1897. Heaths at Boat of Garten, Easterness; Clova, Forfar, H. W. PUGSLEY in *Journ. Bot.* 203, 1922. He also gives as probably this from Tomintoul, Banff, 1905, E. S. MARSHALL; Rhosgoch Bog, Radnor, 1885, A. LEY, both in Nat. Herb. In September the Hon. Mrs ADEANE sent me from Balmoral a leafy, unprickly specimen from Lochnagar which, like that of Bishop Mitchinson's from Invercauld, 1865, also in South Aberdeen, may belong here although in the latter there are some minute prickles on the lower part of the stem. The description in *Flore de France* is “Tiges basses; plus ou moins couchées; épines faibles et rares, ou presque nulles.” It was originally named as a sub-var. by Legrand Fl. Berry, ed. 2, 70, who found it in “marais tourbeux de Nançay,” and that is probably the correct grade.

540. CYTISUS SCOPARIUS Link, forma PALLIDA. Cushnie, N. Aberdeen, 1922. Sent by Mr W. WILSON. The flowers were pale lemon-yellow. G. C. DRUCE.

574 (2). MEDICAGO MUREX Willd. Sp. Pl. iii., 1410, var. MACROCARPA Moris Fl. Sardoa i., 446 = M. SPHAEROCARPA Seb. & Maur. Alien, Mediterranean. Espartal. Leith, 1921, J. FRASER.

Var. OVALIS (Moris) Thell. (*M. ovata* Carmign.). Differs from the type by the more oval legume. Leith, 1921, J. FRASER.

Var. SORRENTINI (Tineo). (*M. inermis* Guss., sub-sp.). Leith, 1921, J. FRASER. These three varieties, which have been determined by Dr Thellung, are owing to the assiduity of Mr Fraser. They are probably introduced with esparto grass. The var. *ovalis* occurs in the Mediterranean areas, the var. *Sorrentini* is of Sicilian origin and differs in the non-development of spines on the legume. It is a handsome and variable species. The first two varieties occurred as adventives at Port Juvenal. See Thellung *Fl. Adv. de Montpellier* 310.

582. M. LACINIATA Willd., var. INTEGRIFOLIA Godron. Bradford, Yorks, 1921. I gathered this plant last September in company with Mr J. CRYER. The species is a native of the Canaries and Northern Africa, but is adventive in France, etc. This variety was first described by Godron on p. 18 of the Flor. Juvenal, and also in the second edition of that work in 1854. It is the *M. diffusa* of Poiret published in Lamarck Encycl. Suppl. 524, 1813, and in Fiori and Paoletti Fl. Anal. Ital. ii., 39, 1900, therefore we should write *M. laciniata*, var. *diffusa*. Dr Thellung identified it.

636. TRIFOLIUM PROCUMBENS L., forma FOLIACEA. In this the calyces become leaf-like. Holy Island, Northumberland, 1884, Rev. H. E. FOX; Sonning Cutting, Berks. See *Fl. Berks* 143, 1897.

637. T. DUBIUM Sibth., lusus vel var. UNGUICULATUM mihi. Found by Mr J. C. COOPER on waste ground at Yiewsley, Middlesex. This is a similar condition to that which often occurs in *Melilotus officinalis*, *M. alba*, and *Medicago lupulina*. The fruits elongate into a long horn-like process, the flowers are small or abortive and the long calyx segments give the inflorescence a curious appearance. Nothing certain is stated in the British floras as to the cause of this growth. It may be due to a mite, or it may be caused by the over-saturation of the soil with nitrogenous matter. The so-called var. *phyllanthum* Seringe of *Trifolium repens* has been attributed to damp seasons. Miss I. M. ROPER has sent me a similar plant from Portishead Dock, N. Somerset, 1922. G. C. DRUCE.

643 (6). DORYCNIUM SUFFRUTICOSUM Vill. Hist. Pl. Dauph. iii., 416. *Lotus Dorycnium* L. Sp. Pl. 778, non Crantz. Alien, south and central Europe. ? Hortal. A small flowering piece sent me by Mrs MARGARET SHARPE from cliffs at Minster-on-Sea in the Isle of Sheppey, where it grew as two striking bushes about two feet high. It may be known from *D. herbaceum* by the narrower and more hairy leaves, the more shrubby habit, and by the keel of the flower being touched with a bluish-black. G. C. DRUCE.

Gen. 145 (3). PSORALEA L.

650 (11). P. BITUMINOSA L. Alien, Eur. mer. Radyr, Cardiff, 1921, R. L. SMITH.

657 (2). ASTRAGALUS STELLA Gouan Illust. ii., 50. See *Rep. B.E.C.* ii., 348. One of the espartal plants first noted in Britain from Leith has been found at Cardiff. It has bluish-purple flowers and smooth, spreading trigonous legumes.

675 (2). HEDYSARUM CAPITATUM Desf. Fl. Atl. ii., 177. Alien, Region Medit. Cardiff, Glamorgan, in Nat. Mus. Wales.

RUBUS. In *The Field* (November 15, 1921) Mr W. CRISP records the discovery in Essex of a Blackberry bush which yielded him 10 pounds of fruit. The berries are "red like a Raspberry; they make an excellent jam, the flavour being that of a Loganberry." In answer to my query Mrs Crisp, for unfortunately Mr Crisp has since died, tells me that he found it "on Fordham Heath, near Colchester, in October and November, and after the ordinary fruit had perished. The jam was rather too sharp, and not quite juicy enough to please everybody." Could it be a form of *plicatus* or its allies?

909. ALCHEMILLA GLOMERULANS Buser. Glen Eunach, Inverness-shire, 1917, Rev. J. ROFFEY; Ben Lawers, M. Perth, 1913, Rev. E. S. MARSHALL [Ref. No. 3885]. See A. J. Wilmott in *Bab. Man.* 579, 1922, and *Journ. Bot.* 163, 1922. Differs chiefly from *alpestris* by the stems and petioles being sub-appressed pilose throughout . . . flowers in dense clusters.

910. A. PASTORALIS Buser. *A. vulgaris* L., em. Buser. Lang-

don Beck Inn, Upper Teesdale, Durham, 1903, A. O. HUME. See A. J. Wilmott in *Bab. Man.* 579, 1922, and *Journ. Bot.* 165, 1922.

1028. DROSERA LONGIFOLIA × ROTUNDIFOLIA mihi. This is D. BELEZIANA Camus (see Rouy & Fouc. *Fl. Fr.* iv., 295). Several French stations for this rare hybrid, which I described in *Rep. B.E.C.* 30, 1911, as British, are given in *Le Monde des Plantes* 5, 1922, by M. Georges Rouy.

Gen. 206 (3). COLOCYNTHIS (Tourn.) L. (*Citrullus* Forskal Fl. Ægypt.-Arab. 167, 1775.).

1075 (11). C. CITRULLUS (L.) O. Kuntze. *C. vulgaris* Schrad. Alien, tropical Africa. On waste ground, Winchester, 1921, Miss TODD. Det. A. Thellung. This is the ‘ Citron ’ of the U.S.A. The fruit, which is 6-8 inches long and 3-4 inches broad, has a smooth, green stem and white, solid flesh. It is the M’tsama Melon of the Kalahari Desert, the chief water-supply of travellers in that region.

1114. PIMPINELLA SAXIFRAGA L., Nogle Studier over. H. E. PETERSEN in *Bot. Tiddsk.* 223-240, t. 4, 1921. Gives three types—(1) *latifolia*—incisions not penetrating half way to the mid-rib (this must be near our var. *poteriifolia* Wallr.); (2) *intermedia*—incisions penetrating more than half way (we put this to *P. Saxifraga*, type); and (3) *dissecta*—which equals the var. *dissecta* With.

1178. SAMBUCUS NIGRA L., var. VIRIDIS Aiton Hort. Kew. i., 374, 1789, based on Caspar Bauhin’s ‘ Sambucus fructu in Umbella viridi.’ Green-berried Elder, included in the *Pinax*, p. 456. Mrs WEDGWOOD found it near Marlborough this year. It is probably this form which is mentioned in the U.S.A. Department of Agriculture, n. 61, p. 54, 1922, as a variety “ from Wiesbaden which has greenish-golden, transparent berries three or four times the size of the Common Elder. They are used in cooking and are found excellent and quite distinct in taste.” Our green-berried Elder, which has also been found at Fyfield (see *Fl. Berks* 255), has berries somewhat larger than the type. The flowers are used, as is well known, to give the muscatel flavour to wine.

1249 (5). ASTER MACROPHYLLUS L. Alien, N. America. Hortal. Lochside Station, near Lochwinnoch, Renfrewshire, August 1922, R. GRIERSON. Det. at Kew. A tall species with lower leaves cordate and white or pale blue ray-florets. Well established.

1262 (7). ERIGERON SPECIOSUS (Lindl.) DC. Alien, N. America. Hortal. Waste places, Bexhill, E. Sussex, 1921. H. L. GREEN. Det. A. Thellung. A handsome garden perennial which Lindley in *Bot. Reg.* 1577 figured as *Stenactis speciosa.*

1264. E. KARWINSKIANUS DC., var. MUCRONATUS (DC.) Ascherson. In *Le Monde des Plantes* 7, 1922, Dr Thellung, under the above name, refers to the species which in the *British Plant List* I put under *E. mucronatus* DC. It is the common, naturalised species of South Europe, also occurring in Guernsey and the Isle of Wight. On the Continent it is frequently called *Vittadinia lobata*, but it is distinct from the true *Vittadinia triloba* Gaudich., an Australian plant which Bentham (*Fl. Austral.* iii., 491, 1866) puts as a form of *V. australis* Rich. Dr Thellung gives the distinguishing characters of *Vittadinia triloba* and *Erigeron Karwinskianus*, the latter of which is a native of Mexico, Guatemala, and Venezeula. He also gives a complete synonymy, and its habitats in Portugal, France, Britain, Italy, Switzerland (Tessin), Egypt, Algiers, and the Ile Maurice.

1324. ANACYCLUS RADIATUS Loisel., var. OCHROLEUCUS Ball Spic. Fl. Maroc 504, 1878. Alien, Afr. bor. Glasgow, 1921, R. GRIERSON. Det. A. Thellung. Lowe originally found this variety near Mogador. It is somewhat intermediate between the type and *A. clavatus*.

1325 (2). A. OFFICINARUM Hayne Arzneikunde ix., t. 46. Alien, S. Europe. Glasgow, 1922, R. GRIERSON, teste Kew.

1355. CHRYSANTHEMUM PARTHENIUM Bernh., var. FLOSCULOSUS DC. Prod. vi., 58. Differs from the type by having no ligules. The Feverfew has been classed by Linnaeus as a *Matricaria*, by Smith as a *Pyrethrum*, by Schultz as a *Tanacetum*, and by Grenier & Godron as a *Leucanthemum*. There is another slight variation in which the ligules are quite small, forma *breviradiatum* (Schultz) = sub-var. *breviradiatum* Rouy & Fouc. (*Fl. Fr.* viii., 263). There are also the well-known garden forma *flore pleno*, forma *variegata*, and forma *aurea* mihi. Mr G. C. BROWN sends the var. *flosculosus* from West Bergholt, N. Essex, and in my herbarium it is represented from Balsall Common, Warwick; Godstow Nunnery, Oxon. I have the forma *breviradiatum* from Greenhithe, Kent; Claverdon, Warwick; and Beaconsfield, Bucks.

1396. SENECIO SQUALIDUS L., forma nova GRANDIFLORUS. This grew at Botley, Oxford, on waste ground with many plants which had normal sized flowers. With them grew three or four patches of this large-flowered mutant. Neither soil nor exposure were factors in producing them for they grew mixed with, and on the same soil as, the type, and no intermediates were noticed. The ligules were from 25 to 30 per cent. larger than those of the type. G. C. DRUCE.

1396. S. SQUALIDUS L. *Senecio squalidus* seems to be a very variable plant. In Sicily I saw it in four distinct varieties.

(1) *S. Aetnensis* Tan. Leaves spathulate, slightly toothed or nearly entire; achenes glabrous. Grows in elevated regions of Mount Etna.

(2) *S. squalidus*, var. *glaucescens* Spr. Leaves irregularly and coarsely toothed; achenes glabrous or pubescent. Grows in an intermediate belt between the stations of *Aetnensis* and *typicus*; it occurs frequently mixed with both forms.

(3) *S. squalidus typicus.* Leaves irregularly pinnatifid with lobulated or coarsely toothed lobes; achenes silky. Grows on the lower slopes of Mount Etna.

(4) *S. squalidus chrysanthemifolius* Poir. (*Siculus* All.). Leaves 2-pinnatifid with narrow, nearly linear lobes and lobules; achenes silky. Grows on low land in Sicily.

The variety *glaucescens* is a connecting link or a hybrid between *Aetnensis* and *typicus*, two well distinguished plants. There occur frequently all intermediate forms between *glaucescens* and the two other species or varieties. The var. *chrysanthemifolius* seems to be only an extreme state of *typicus*. Dr W. A. FOCKE.

1405. S. PALUSTRIS Hook. This was included in the List of Extinct Plants which appeared in *Rep. B.E.C.* 733, 1919. It has been re-discovered, in August of last year, in central Norfolk by Sir H. Beevor. A most interesting record. See W. G. Clarke in *Trans. Norf. Nat. Hist. Soc.* 3, 1922. [illegible]

1412 (3). BERKHEYA CERNUA (L. f.) R. Br. (*Didelta cernuum* Less.) Alien, Afr. austr. Lanal. Bradford, York, August 1920, J. CRYER.

1446. SERRATULA TINCTORIA L., var. CAMPANULATA Rouy Fl. Fr. ix., 106. Plante de 4-5 déc., robuste, ± rameuse ou bifurquée vers le haut; feuilles ovales ou lancéolées, entières; calathides medioeres, brièvement pédonculées, peu nombreuses, en corymbe un peu lâche; pericline campanulé, large à la base et non attenué, à folioles assez grandes, imbriquées sur 4-5 rangs. Under this, provisionally, I put a curious plant gathered by Messrs THURSTON and TRESIDDER at St Martin in Vicinage, Cornwall, in 1922. The basal leaves are 8 in. long by 2½ in. broad, entire, but with the margin irregularly toothed with small teeth; the flowering stem leaves 2½-3 in. long by ¾-1 in. broad, lanceolate, and cut at the base into small lobes ¼ in. long; heads stalked, few, in a very loose panicle, bell-shaped, with a broad base; phyllaries broad, narrowing upwards, in five rows, the margins covered with short, white, shaggy pubescence. The achenes are not ripe but seem to be small. It may be worthy of a distinct name as it has long, not short, peduncles and has other variations. I have found entire-leaved forms near Brickhill, Bucks, and in Warwickshire, but these are a different form. Again, from the north coast of Jersey, I have very robust-headed forms, but the heads are not truly sessile as in var. *alpina* Gren. & Godr., which Rouy, *l.c.*, makes synonymous with his ' forme *S. macrocephala*,' under which he puts, as a var., *monticola* (Bor.). He also has a var. of the forme *macrocephala*, var. *subintegra*, which in many ways applies to the Cornish plant under review, but the pericline, as a whole, is not pubescent, the calathides are not twice as large as in *tinctoria*, and the achenes are not larger.

1497. CREPIS CAPILLARIS (L.) Wallr., nov. var. GLANDULOSA. *C. nicaeensis* of the Orkney Flora, not of Balbis. In 1921 Colonel

Halcro Johnston accompanied Mrs Wedgwood and myself to the waterworks reservoir near Kirkwall to show us *nicaeensis.* I was sceptical of the large flowered *Crepis* which grew there being *nicaeensis*, and indeed on my return to Stromness threw the greater part of my gathering away. On returning home my scepticism increased and for confirmation I sent a plant to Dr Thellung, who replied—" Certe non *Crepis nicaeensis* ob receptaculum mamillatum glabrum. In *C. nicaeensis* receptaculum profunde favosum fovearum marginibus elevatis fimbriato-ciliatis "—a distinguishing character which is not given in our British floras. The plant of Kirkwall is a not uncommon form in Scotland. It is characterised by the more glandular and darker coloured phyllaries, the somewhat short peduncles, and its robust growth. I have seen it from Elphin, Sutherland, and Inverbroom, W. Ross; also from near Newquay (*Vigurs*), and Ponsanooth, Cornwall (*Davey*). Some plants named *agrestis* W. & K. by British botanists also come under this. The true plant of Waldstein & Kitaibel was discussed in the *Report* 574, 1916, where the description says nothing of black, glandular hairs, and the flowers are not large—in fact, it is very close to, and may possibly precede, *runcinatus* Bisch. Koch (*Syn.* 440, 1837) added " capitula duplo majora." Rouy, Foucaud & Camus (*Fl. Fr.* ix., 229) describe a sub-species, *C. agrestis* W. & K., " calathides nettement plus grandes ; folioles de péricline pédoncules (et parfois même rameaux) hérissés de longs poils noirs, étalés, entremêlés de quelques poils glanduleux ; stigmates bruns," which seems to fit these plants, but I have not been able to consult the type. Obvi usly they do not agree with Waldstein & Kitaibel's description. Hence it seems desirable to give our plant a definite, varietal name. G. C. Druce.

1502. C. TARAXACIFOLIA Thuill., nov. var. SUBINDIVISA mihi. This differs from the type by the leaves being entire, with about twelve short teeth on each side of the entire, almost spathulate lamina. This variety I found on waste ground at Ware, Herts, last May, with Miss Trower. Mr Thurston sent a similar plant from Biscovey, Cornwall, and I have it from Ventnor, Isle of Wight. G. C. Druce.

1645. TARAXACUM SIMILE Raunkier in Dansk Excurs. Fl. 2 udg. 1906. Sweden, Norway, and Denmark. North Berwick, Haddington, 1904, G. C. DRUCE.

1645. T. PROXIMUM Dahlst. in Bot. Not. 1905 et Exsicc. fasc. i., n. 11, 1911. Sweden, Norway, Denmark, and Finland. A plant, nearest to this, was gathered by me on the Salisbury Crags. Midlothian, in July 1878, G. C. DRUCE.

1645. T. ARRHENII Palmgren in Act. Faun. et Fl. Fennica xxxiv., i., 25, 1910. Isle of Aland. Oxford, 1916; Hailey, Oxon [Y. 92], 1921; Oxford Parks [Y. 105], distributed through the Club (see *Rep. B.E.C.* 569, 1921). Oxford [Y. 96]; Stow (not Stour) Wood, Oxon [Y. 50], *l.c.* as a related form, and also as a form from Princes Risborough, Bucks [Y. 44], G. C. DRUCE.

1645. T. NAEVOSIFORME Dahlst. in Arkiv. for Botanik, band 12, n. 2, 49, 1912. Norway. Allied to *naevosum*. Twl Dhu, Carnarvon, at 2000 ft., 1900; Teesdale, Durham [No. 9799]; Kirkwall, Orkney, 1920; Bressay, Shetland, 1921, G. C. DRUCE.

1645. T. DUPLIDENS Lindb. fil. in Act. Faun. et Fl. Fennica 29, 1907. Norway, Sweden, Scania, Russia, and Denmark. Near Stow Wood, May 1912, G. C. DRUCE; Odiham, N. Hants. C. E. PALMER, in *Hb. Druce*; Ham Common, Surrey [N. 807], W. A. TODD.

1645. T. DECIPIENS Raunkier Dansk Excurs. Fl. 2 udg. 1906. Sweden, Norway, and Denmark. A form of this on Banstead Downs, 1922, W. A. TODD.

1652. LACTUCA MACROPHYLLA A. Gray. *Mulgedium macrophyllum* DC. *Cicerbita macrophylla* (Willd.) Wallr. Alien, Caucasus. Hortal. In a field in the parish of Meole where it has been known for thirty years. It also grows near Shrewsbury. The specimen was kindly sent by Miss AGATHA WILKINSON in July 1921. It is a handsome, garden species, four feet high, with large heads of pinkish-purple flowers. The large, cordate, radical leaves distinguish it from *alpina*. Can it be the *alpina* of *Rep. B.E.C.* 272, 1915, from Salop, of which only a scrap was sent me? *L. macro-*

phylla has also been sent me from Patterdale, Cumberland, by the Rev. W. WRIGHT MASON.

1669. PHYTEUMA SPICATUM L., sub-var. CAERULEUM Rouy & Fouc. Fl. Fr. x., 85 = var. CAERULEUM Gren. & Godr. Probably introduced. Further research is needed. A solitary specimen was found by Mrs STOKES in a rough bank at Bridhdir, Merioneth, 1922, below the Lodge of Mrs Richards, "which is cut for hay. The Lodge has no garden except a bed of geraniums, so it could not have been a stray seed from any garden as there is no other house near. The bank has been rough pasture for the last 40 years. The adjoining farm is only a hill-farm with primitive cultivation." Mrs Richards, *in litt.* The discovery is an interesting one, but the place should be examined carefully to see if it occurs again and in greater quantity. The plant differs from the Sussex *spicatum*.

1680. (2). LEGOUSIA FALCATA (R. & S.), comb. nov. *Specularia falcata* A. DC. Mon. Camp. 345. Alien, Reg. Medit., Persia, Asia Minor. Old Camp, Basingstoke, Hants, 1916, J. F. RAYNER.

1699. ERICA VAGANS L., var. KEVERNENSIS Turrill in Kew Bull. 175, 1922. There diagnosed as "a planta typica corollis late campanulatis roseis haud purpureis, lobis plus minusve reflexis praecipue differt." It was found on the same day by Mr P. D. WILLIAMS very near to the spot where he discovered that interesting hybrid of *E. vagans* with *Tetralix* which (*Rep. B.E.C.* 24, 1911) I named × *E. Williamsii*. Only one plant of *kevernensis* was found but, fortunately, cuttings were taken as the original plant was afterwards destroyed by cattle. Plants from Mr Williams were sent to Kew, where they now occupy an entire bed near beds of typical *vagans* and *Williamsii*. Dr Hill and others have noticed reversions of *kevernensis* to the type. At present it is not ascertained whether we have in this plant a true variety or a mutation which may not be perpetuated by seed. The plant is more ornamental than *vagans*. I saw beautiful specimens in flower at Westonbirt last October which showed no traces of hybridity.

1710. PYROLA SECUNDA × MINOR. This year Mr STANLEY REDgrove sent me a specimen which was gathered by E. G. Beach in the Findhorn Gorge, Elgin, where both the assumed parents grow, of a *Pyrola* which has the smaller and more toothed leaves of *secunda* but with the larger and whiter flowers of *minor*. If the assumed origin is correct it is an extremely interesting hybrid, hitherto unrecorded.

1725. Primula vulgaris L., Teratology of. G. Beauverd in *Bull. Soc. Bot. Genev.* 8, 1921. Pollination of the British species, Miller Christy in *Journ. Linn. Soc.* 105. 1922.

1757. Centaurium pulchellum Druce. var. palustre (Gaudin) nov. comb. Gathered by Lady Davy and Miss Bacon on Hayling Island, S. Hants, September 1921. Gaudin (*Fl. Helv.* ii., 137) describes his variety as " caule simplici filiformi unifloro vel superne sub-dichotomo paucifloro." This is close to, if not identical with, forma *simplicissimum* (Schmidt) Zimm. (see *Rep. B.E.C.* 569, 1919) and var. *Swartziana* Wittr. in Bot. Centralb. xix., 62, but Gaudin's trivial appears to be the earliest. The Hayling Island plants are tetramerous, having the calyx tube segments and corolla lobes in fours. I have similar plants from Guernsey, Isle of Wight and Kent.

1760. Gentiana Pneumonanthe L. The specific name is said to have been first used by Cordus in 1541. The true Shamrock and how to identify it, *l.c.*, 139, 1921. J. Britten in *Garden* 19, 1921.

1776 (6). Nemophila Menziesii Hook. & Arn. Beechey Voy. 152. Alien, North America. Hortal. Glasgow, 1921, R. Grierson. Det. A. Thellung, who suggests its being compared with the subspecies *liniflora* (Fisch. & Mey.) Brand. This is a pretty garden plant introduced in 1836. It has many cultivated varieties.

Gen. 432. Ipomoea L.

1832 (5). I. purpurea (L.) Lam. *Pharbitis purpurea* Voigt. *P. hispida* Choisy. Alien, tropical America. Hortal. Eastville, Bristol, 1921, Noel & Mrs Sandwith. Det. A. Thellung. This is the well-known *Convolvulus major* of seed catalogues, and here, of course, of only garden origin. When it was found the unopened.

whitish corolla was not easily recognised. It is figured as *Convolvulus purpureus* in Bot. Mag. t. 318, and was introduced into cultivation in Britain as early as 1629.

1833. CONVOLVULUS ARVENSIS L., forma PURPURASCENS Lindm. Svensk. Fl. 457. Fallow fields on downs above Abinger, Surrey [Ref. No. 2511], June 1922. Stems prostrate, not twining, flowers purplish-red coloured. C. E. BRITTON.

1835 (2). C. SICULUS L. Alien, Mediterranean. Slateford, Midlothian, September 1906, J. FRASER.

1836 (4). SOLANUM AVICULARE Forst. f. Prod. 18. Alien, New Zealand, Australia. Tresco, Scilly, 1920, A. J. HOSKING in *Supp. Fl. Cornw.* 95, 1922.

1846 (3). S. NITIDIBACCATUM Bitter in Fedde Rep. Sp. Nov. xi., 208, 1912. Alien, Chile, Argentina, Bolivia. Sent me from N. Wales by A. DALLMAN. Dr Thellung says the specimen is too young for positive identification.

1850 (3). S. MARITIMUM Meyen, ex Nees in Nov. Act. Nat. Cur. xix., Suppl., 384, 1843. Alien, Chile. Chicken-run, Swaythling, S. Hants, June 1921, J. F. RAYNER. Det. at Kew. A pretty plant with finely and acutely-cut leaves.

1859 (6). NICOTIANA ? × SANDERAE Hort. Sander = N. AFFINIS × FORGATIANA. Alien. Hortal. Battle Abbey, Sussex, 1921, H. L. GREEN.

1873. LINARIA VULGARIS Miller, forma nova vel lusus VAN DE WEYERI. This plant has a striking appearance owing to its pale, regular, yellow flowers, scarcely a trace of a darker yellow being seen in the throat. The leaves are narrow; the plant quite eglandular; the corolla cut nearly to its middle into four nearly equal, oblong, bluntly apexed lobes; the lip completely obsolete; the spur absent from most of the flowers. On my specimen, which has about thirty blossoms, only one has a spur. This season it did not set seed. It was discovered by Major Bates van de Weyer, after whom it is named, on a railway embankment in the parish of Avington, Berkshire. G. C. DRUCE.

1874 (2). L. HETEROPHYLLA Desf. Fl. Atl. ii., 48, 140. *L. stricta* Guss. Fl. Rar. Sicil. 250, 1826. Alien, Sicily, N. Africa. Carinal. On ballast at Radyr, Glamorgan, 1921, R. L. SMITH. A pretty species with narrow upper leaves and bright yellow flowers having an orange palate. I once found it near Messina.

1894. SCROPHULARIA NODOSA L. Formae novae. Fedde Repert. 455, 1921.

1896 (2). S. HOPPII Koch. Alien, Europe. Radyr, Glamorgan, R. L. SMITH. Det. W. B. Turrill.

1903 (3). DIGITALIS LUTEA L. Alien, Europe. Hortal. Looe dust heap, Cornwall, E. THURSTON in *Supp. Fl. Cornw.* 100, 1922.

1923. VERONICA PERSICA Pers., Floral Variation in. T. A. SPRAGUE in *Journ. Bot.* 351, 1922.

1930 (5). V. SALICIFOLIA Forst. f. Prod. 3. Alien, New Zealand. Hortal. On river-bridge, Lostwithiel, Cornwall, C. C. VIGURS in *Suppl. Fl. Cornw.* 101, 1922.

1934 (2). EUPHRASIA CONFUSA Pugsley, forma ALBIDA in Journ. Bot. 1, 1922. Differs from the yellow-flowered type by its white flowers and sometimes more robust habit. Mr Pugsley gathered it with the type at Simonsbath. It also occurs at Farthing Downs, Surrey; St Cleer Downs, etc., E. Cornwall; and Mr Pearsall's "*E. Kerneri*, simulating *minima*," from Derwentwater, is thought to be the same form. Mr Pugsley doubts the occurrence, on present evidence, of Host's *E. stricta* in Britain.

1986 (3). VERBENA BONARIENSIS L. Alien, America austr. Bradford, Yorks, 1920, J. CRYER. Probably this.

1986 (4). V. BRACTEATA Cav. Alien, Amer. bor., etc. Bodmin Road Station, HARVEY in *Suppl. Fl. Cornw.* 106, 1922.

1999. MENTHA RUBRA × M. CITRATA Ehrh. = (M. SPICATA × AQUATICA) × (AQUATICA × ARVENSIS × SPICATA). Between Stanstead Church and Roydon Station, Herts, 1843, W. H. COLEMAN. To this combination Mr J. Fraser suggests referring a Mint in my herbarium. As he points out, " it has the glabrous character of the two putative parents. The rounded form of the upper leaves suggests *rubra*. The verticils are two more in number than in *aquatica*, and the inflorescence as a whole compels one to look for a verticillate Mint, such as *M. rubra*, as one of the parents." I have gathered *M. citrata*, to which Coleman referred this plant, close to Roydon. Further investigation is needed, and one hopes Miss Trower may be fortunate enough to re-find the same interesting Mint.

2011. SATUREIA CALAMINTHA Scheele, var. VILLOSA (Boiss.), comb. nov. *Melissa Calamintha* L., var. *villosa* Boissier Voy. Bot. d'Esp. ii., 497, 1839-45, defined ' Tota pilis albis patulis obsita.' *Calamintha officinalis*, var. *villosissima* Boiss. (cit. fals.) Willkomm & Lange Prod. Fl. Hisp. ii. *C. menthaefolia*, var. *pauciflora* Lange Pugil. 176. *Calamintha baetica* Boiss. & Reut. Pug. 92, 1852. Spain, Portugal, Algeria. The following is the description in the *Prod. Fl. Hisp.* Canescens, caule adscendente 1-1½ l., ramosissima ramisque patule et dense albo-villosis; foliis mediocribus v. parvis; breviter petiolatis, ovato v. triangularia-deltoideis, basi truncatis, obtusissimis et obtusissime crenulatis, molliter et adpresse villosis, subtus elevato-nervosis, cymis paucifloris, breviter pedunculatis v. subsesillibus, pedicellis hirtis pedunculo longioribus; calycis fructiferi nutantis tubo turbinato, corollae roseae patule hirtae tubo calyce duplo longiore, a basi sursum valde ampliato. Trabut & Battandier (*Fl. Alger.* 680) say " Plante très velue, à tiges ascendantes, rameuses; petits feuilles très brièvement pétiolées, tronquées à la base, crénelées, velues, fortement nerviées; fleurs grandes. comme dans *C. officinalis* en cymes pauciflores, brièvement pédonculées; calice assez semblable à celui du *C. Nepeta*, moins élargé à la base, nutant à la floraison." Discovered by Mr H. W. PUGSLEY near Swanage, Dorset, in 1922. See *Proc. Linn. Soc.* December 1922. The grade of this plant is somewhat doubtful. On a *Taraxacum* standard it may well deserve the specific rank which Boissier

& Reuter accorded it. Boissier had, however, first established it as a variety, and it is a pity that in raising it to a species the early trivial was not retained. Lange also at first gave it varietal rank, while Nyman (*Consp. Fl. Eur.* 588) makes is a sub-species. In the *Index Kewensis* it is referred to *C. officinalis*. Unfortunately in our *List* the sub-sp. grade is not adopted, and it is also rejected in the *Cambridge Flora*, so that one has to choose between the specific or varietal grade. As I have not seen the British plant growing I fall back upon Boissier's earlier view. *S. Calamintha* is a polymorphic species. Further study may show that the higher grade is deserved. In such a case I suppose it should be called *Satureia boetica* (B. & R.) comb. nov., rather than *C. villosa* unless the earliest trivial (in any grade) is to be used. It may be added that Boissier distributed it from Spain (No. 1986) as *C. officinalis* in his *Exsicc. Hisp.-Lusit.* It is an extremely interesting addition to the British flora.

2056. STACHYS SYLVATICA L., Observations on Variations in the Flowers of. E. M. CUTTING in *Ann. of Bot.* 405-425, 1921.

2092. PLANTAGO LANCEOLATA L. Mr B. Millard Griffiths in *Journ. Bot.* 228, 1922, gave the results of cultivating some forms of *P. lanceolata*, including the so-called variety, *sphaerostachya*. "The resultant plants were all large and robust *lanceolata* of typical form, with long leaves, long peduncles, and cylindrcial inflorescences." The experiments, which were repeated at Newcastle, seem to indicate " that the varieties of *lanceolata* are largely dependent on habit, and that the variety *sphaerostachya* can be produced at will by putting the plant under unfavourable conditions of growth." This was a conclusion arrived at by Dillenius about 1720, for he says, of round-headed plants brought from Salsey and Llanberis, " in vulgarem transit." See *Rep. B.E.C.* 583, 1910, where I said that " an individual plant [from Jersey] kept true for one year in my garden, but the next year reverted to type." Mr Griffiths also experimented with the large and small forms of *P. major*, but one would like to see check cultures made before arriving at a definite opinion.

2092. P. LANCEOLATA L., Sur des Epis Teratologiques du. L. Plantefoi in *C. R. Acad. Sc. Paris* 1108-1111, 1921.

2099. P. MAJOR L., Uber Salzformen von. = P. WINTERI Wirtg. Verh. Bot. Prov. Brandbg. 102, 1922.

2100 (3). P. ARISTATA Michx. Fl. Bor. Amer. i., 95, 1803. *P. patagonica* Jacq., var. *aristata* A. Gray Man., ed. 2, 269, 1856. See *Rep. B.E.C.* vi., 42, 1920, and 302, 1921. Dr Thellung thus refers Mr Biddiscombe's plant from Woking. Mrs Sandwith saw it also in 1922 at the Bristol Docks. *P. aristata* is a common North American species.

Gen. 505 (2). ALTERNANTHERA Forsk. Fl. Ægypt.-Arab. 28, 1775.

2116 (30). A. NODIFLORA Br. Prod. i., 417. Alien, tropics. Lanal. Bradford, Yorks, 1921, J. CRYER. An attractive species, with glossy, scarious, white flowers clustered at the nodes.

2124. CHENOPODIUM ALBUM L., var. PSEUDO-BORBASII (Murr as a sub-sp.), f. OPULIFORME (Murr) as a var. Maplestead, N. Essex, 1922, G. C. DRUCE.

2124. C. ALBUM × OPULIFOLIUM = sub-sp. PLATANOIDES J. B. Scholz. Near Hythe Quay, Colchester, September 1922, G. C. DRUCE.

2124. C. ALBUM L., var. SUBSTRIATUM Murr, f. MICROPHYLLUM Murr (as var. or forma of sub-sp. *pseudo-striatum*). Northampton, 1921, G. C. DRUCE. Near to *C. striatum* but with more farinose glomerules and more acute leaves.

2124. C. ALBUM L., var. (as sub-sp.) SERRATO-SINUATUM (Murr). Colchester [Ref. No. 2017], 1922, G. C. BROWN.

2124. C. SUBOPULIFOLIUM Murr. See *Rep. B.E.C.* vi., 304. 1921. *C. album* × *opulifolium*. Brislington, Bristol, 1921, Mrs SANDWITH.

2125. C. LEPTOPHYLLUM Britt. & Brown, var. OBLONGIFOLIUM S. Watson. Alien, N. America. Sent, as a form of *C. album*, from near Southampton, by Mr J. RAYNER, in 1921. Det. A. Thellung.

2127. C. GLAUCUM L., var. PROSTRATUM Beck Fl. Nied.-Oestr. 331, teste Murr. Hayle, Cornwall, 1915, F. RILSTONE.

2130 (4). C. BERLANDIERI × STRIATUM (near to × *C. pulchellum* Murr ined.), receding in some of its characters to *C. Berlandieri*. Aberdovey, Merioneth, Mrs DEBENHAM.

2131 (14). C. FOETIDUM Schrad. in Ges. Nat. Fr. Berl. Mag. ii., 79, 1921. Alien, tropics. Lanal. Waste ground, Bradford, J. CRYER. A pretty, much divided Goosefoot which Mr Cryer showed me in situ. Doubtless one of the wool or skin aliens.

2151 (3). ATRIPLEX CAMPANULATUM Benth. Fl. Austr. v., 177. Alien, Australia. Lanal. Galashiels, Selkirk, 1910, Miss HAYWARD and G. C. DRUCE; Bradford, York, 1921, CRYER & DRUCE. Dr Thellung suggests this identification from the description only. A similar plant has been found in Switzerland. See Thellung in *Viert. Nat. Ges. Zurich*, lxiv., 726, 1919.

2184. POLYGONUM AVICULARE L. = P. HETEROPHYLLUM Lindm., var. LITORALE (Link), forma GRANDIFLORA Druce in Rep. B.E.C. 519, 1921. A very robust plant with large leaves and large flowers from the coast at Uyea, Unst, Shetland.

2196. RUMEX AQUATICUS × DOMESTICUS = R. ARMORACIFOLIUS Neum. Montell in Medd. Soc. pro Faun. et Fl. Fennica 58, 1921.

2210 (13). R. OBOVATUS Danser. *R. paraguayensis* Parodi. Thell. in Rep. B.E.C. 258, 1920. Ware, Herts. 1914, DRUCE; Elland [Ref. No. B 73], Tingley [Ref. No. B 79], Yorks, 1918, E. C. HORRELL; Hull, Yorks, Miss COBBE; Glasgow, 1920, GRIERSON; Bristol, 1920, NOEL SANDWITH. *R. dentatus* L., from Glasgow, must be deleted.

2210 (14). R. CUNEIFOLIUS Campd. Mon. Rumex 66, 95. Alien, South America. Adventive in Holland and Germany. Leith Docks. 1921, J. FRASER; Phellack sand-dunes, Cornwall, near the site of a mule camp, THURSTON & RILSTONE. Det. A. Thellung. Mr Fraser has known it at Leith for nearly twenty years. Mr Thurston sent it me from Cornwall also in 1921. Probably in the latter place it owes its occurrence to mule-fodder from Argentina or the Falklands.

2216. HIPPOPHAE RHAMNOIDES L., The Names of. Arthur Bennett in *Naturalist* 157, 1922. Wyebibble is a name given in Wright's *Dialect Dictionary* and is used in Norfolk, and Morley (*Eng. Writers* i., 247) says there is the prefix in Wiveton or Wiverton, a village in Norfolk, and "Wive-ton the settlement of the people of Wiva."

2244 and 5. ULMUS MONTANA Stokes and U. CARPINIFOLIA Borck (NITENS). In *Journ. Bot.* 36, 1922, Mr MILLER CHRISTY has a paper on the flowering times of these species. The former dates from March 2, the latter from December 27 and January 4. Miss E. ARMITAGE (*l.c.*, p. 141) gives January 16 as a date of the flowering of the English Elm.

2245. U. MONTANA. Was ist unter den namen *U. montana*, var. *nitida* Fr. zu verstehen *Bot. Not.* 71, 1921.

2250. URTICA DIOICA L., The Ecology of. Carsten Olsen in *Journ. Ecol.* 1-18, 1921.

2252 (4). U. INCISA Poir. Alien, Australia and New Zealand. Ide, Devon, 1918, Miss TODD. Dr Thellung suggests this curious Nettle may be this species, and 'Kew' so names them. It has occurred in Switzerland as an adventive.

2252 (5). U. FLABELLATA H. B. K. Alien, South America. Lanal. Bradford, York, July 1905, J. CRYER. Det. A. Thellung, 1921.

2258. ALNUS GLUTINOSA Gaertn. Mr A. D. WEBSTER (*Gardeners' Chronicle* ii., 84, 1922) has an interesting article on the use of the wood of the Alder for making clogs. He states that clog-making is one of our oldest industries, and that in 1200 the English Archers petitioned the King to prohibit the use of Aspen for that purpose or there would be a shortage of wood for their bows and arrows.

2258 (2). A. INCANA Medik. Pfl. Anat. 393, 1792. *Betulus Alnus*. var. *incana* L. Sp. Pl. 983, 1753. Loudon Arb. fig. 1543. Alien, Europe, even arctic, Northern Asia, and North America.

Introduced into Britain in 1780 (Loudon). *A. incana* is a tree from 8-30 feet high (Loudon gives 50 to 70 feet), with a smooth, greyish bark; the broadly oval or ovate leaves are slightly pointed or even acuminate in the young shoots, sharply serrate or biserrate, slightly hairy above, and covered usually with a short greyish tomentum which gives a hoary appearance to the foliage; the nerves are in 10-15 pairs but lack the tuft of hairs at their base which is so often present in *glutinosa*; male catkins 2-4; female 3-6, brownish-grey, denser and larger than in *glutinosa*; fruit large, pentagonal, reddish-brown, not shining. It is said to affect drier situations than *glutinosa*. In Norway it is a conspicuous tree on the lower slopes of the mountains and by lake sides, but I observed no trees taller than 25 feet. Usually it forms a close scrub. In North America it grows in thickets along the stream sides, and there rarely exceeds 20 feet. In the Jura and Alps it rejoices in the proximity of mountain streams. It may be distinguished from *glutinosa* by the characters given above, *i.e.*, the young branches pubescent, not glabrous; by the more pointed, not rounded, leaves; by the pubescent-tomentose covering of their lower surface and by the tufts of hairs in the nerve-axils being absent. In 1921 Mr J. LITTLE sent me a specimen from near Hitchin, Hertfordshire. In 1922 the Rev. W. WRIGHT MASON brought me a specimen to name which he gathered in 1920 in Cumberland which consisted of leaf-branches of the same species. He gathered it in the parish of Melmerby, by the side of the Sunny Gill Beck, in a plantation of young larch and spruce. The tree from which the specimen was gathered is between thirty and forty feet high. A second tree, presumably of the same species, is about twenty-five feet high. Both are this year without catkins. The method of introduction, for at present we have no evidence which warrants us in claiming it as a native, is doubtful. We have been unable, so far, to obtain a clue as to whether they were an accidental or intentional introduction. The size of the Melmerby trees shows that they are not less than 30 years old. In the *Guide to the Cambridge Botanic Gardens* Mr Gilbert-Carter says it is "Naturalised in the district of Furness, where it has been planted as windscreens, and in other parts of Britain." From the geographical distribution it is a tree which we might have expected to occur in Britain. G. C. DRUCE.

2304. NEOTTIA NIDUS-AVIS Rich. M. C. RAYNER (*Gard. Chron.* 102, 1922) in two brilliant papers gives some fascinating information about the bionomics of the partnership of this orchid and its fungal friend. The orchis, which is often rootless, in no case produces sugar from the carbon dioxide of the air. It would seem that the fungus is the working partner, since it can draw upon the soil humus for both its carbonaceous and nitrogenous food materials. This subject was very fully dealt with in lectures before the Ashmolean Society by Dr Vines some years ago. In a remarkable Japanese species, *Gastrodia elata*, it has been proved that the orchid plant is parasitic upon the fungus during part of the life-cycle—a most unexpected thing since the fungus host is the Honey Agaric, *Armillaria mellea*. The *Gastrodia*, which consists of a rootless tuber, periodically throws up an immense inflorescence. Owing to the absence of roots and the corky covering of the tuber fresh supplies of food material can enter the plant only through the rhizo-morphæ of the fungus. . . . Eventually the whole of the invading hyphae are digested and the soluble products absorbed by the cells of the tuber. Only when this happens can the plant reproduce itself by seed. Therefore the term saprophytic, so generally applied to *Neottia* and other chlorophylless plants is incorrect. But fungi are present and necessarily present in many other plants—*Asparagus officinalis*, *Colchicum*, *Anemone nemorosa*, *Teucrium Scorodonia*, *Stachys officinalis*, *Ericas*, *Calluna*, and many others. Dr Rayner describes the method of infection of the Ling, which differs materially from the case of the *Neottia*, by the fungus which takes place while still within the fruit followed by inoculation of the seedling from the seed-coat at germination. *Calluna* is therefore like the Lichen—if indeed that theory be correct—a dual organism. Only for a brief space of time within the resting seed does the embryo retain its individuality as an independent plant. The suggestion made is that in the case of plants like Ling and Heather which often monopolise large areas of soil poor in available nitrogenous material that the fungus in this symbiotic partnership possesses in some degree the power of utilising atmospheric nitrogen as a source of food. *Neottia* and *Hypopitys*. which are found growing in barren, chalky soils, may also by means of their " co-operating fungus " benefit in a similar way.

2325. ORCHIS LATIFOLIA L. Mr R. F. TOWNDROW, of Malvern, sends this communication:—" I am much interested in the unravelling of the *Orchis latifolia* tangle which you are conducting. This summer I paid a visit to a small swamp where I used to gather Marsh Orchids and, as I expected, found *O. praetermissa*, fine *O. Fuchsii*, and what I used to call *O. latifolia*, and also plants which I used to think hybrids of *latifolia* and *maculata* (that is *Fuchsii*). I now feel that *latifolia* as a species must go, and that the plants I originally called by that name must be looked upon as *Fuchsii* × *praetermissa*. Those which I then called hybrids of *latifolia* and *maculata* (*Fuchsii)* must either be second crosses or contain an extra dose of *Fuchsii* in their composition. This, as far as I can gather, would be your own view, after a much larger experience. You have, I have no doubt, noticed how destructive to Meadow Orchids is the use of basic slag. I suppose it really destroys the fungi in the soil from which part of the nutriment is derived." It may also, by its basic character, change the acid character of the soil.

2325. O. LATIFOLIA L. What is *Orchis latifolia* L.? An attempt has recently been made by Mr A. J. Wilmott at a Linnean Society meeting to restrict the name *O. latifolia* L. in the sense of *praetermissa* on the somewhat unstable evidence of supposed specimens of *praetermissa* which were found recently in a locality which nearly 200 years ago yielded a plant which is grouped under *latifolia* by Linnaeus. Orchids are notoriously uncertain in their occurrence. The marsh which may afford numbers of *praetermissa* one year may show hardly a solitary specimen in the next. In a meadow which I know *incarnata* was abundant with a few *praetermissa* one year, another season gave plenty of *praetermissa* and only a few *incarnata*. It must be borne in mind that although Linneaus gave the Oeland locality for a plant which is placed under his *latifolia*, yet that was only one of many grouped under that name, and no such restriction is placed upon the habitat when he established his ' species.' He gives " in Europa pratis."

The description of *O. latifolia* (*Sp. Pl.* 1753)—and it is the description which is of primary importance—eliminates *O. praetermissa* since the only important segregating character, "labio trilobo lateribus reflexis," given by Linnaeus does not apply to *praeter-*

missa. Beneath the description Linnaeus adds many references, for they are references rather than synonyms, which refer to three or four different plants. These need not be given in detail. We must turn to his paper in the *Acta Upsala* p. 15, 1740. Linnaeus thought there were two species of the palmate Orchids. One he has quite clearly segregated in the *Species Plantarum* as *O. maculata* which has the " nectarii labellum trifidum, planum; lobis lateralibus majoribus crenatis; intermedio angustissimo, integerrimo," localised " In Europa pratis succulentis," which rather applies to *maculata* than *Fuchsii.* The other is *O. latifolia* which will be seen in the *Acta* to be a group (not a separate entity) consisting of at least four species of which he gives two pages of synonyms, etc. The details of these would only weary the reader, but under it he had brought every name which he thought did not apply to *maculata.* That he cites the *Acta* under *O. latifolia* in *Sp. Pl.* 61, 1753, shows conclusively that it is a compound species too indefinite to allow it to be used in a segregate sense even on the principle of residuals, much less on a habitat basis, since any precision which one reference may have is nullified by the general habitat given for *O. latifolia.* Again the description of the type of the *Acta* (if such it can be called) is " labio trilobo integerrimo " which excludes *praetermissa* and probably means *incarnata.* There is no allusion to the leaves, whether spotted or unspotted, or their tint of colour, or whether the stem is hollow or solid. There is nothing to show that it may not be *Helodes* or *incarnata.* Among the references is one to Morison, t. 15, f. 3, where Bobart has probably had figured the *Orchis praetermissa* from the Oxford meadows, although his text description is quite vague. The plant of the Hortus Cliffort. 429, also mentioned, may be this species, as may be the specimen in Herb. Cliffort. But it is only guess work to try and identify many of the synonyms cited. The most important synonym in the *Sp. Pl.* is that cited from the *Flora Suecica* because there he is speaking of a plant he has seen and not a book description he has read, or of which he has only seen a figure, or a dried specimen. This shall now be dealt with. First, however, it should be remarked that Linnaeus' treatment of the Orchid Family was greatly criticised by Haller and other acceptors of the Tournefortian genera. Nor was this to be wondered at. Linnaeus was evidently at his worst in his generic concepts of the Orchidaceae. For instance, his genus *Orchis* consists of such diverse constituents as *Satyrium*, *Disa*, *Habenaria*, *Zeuxine*, *Limodorum* and *Bartholina*. His genus *Satyrium* included species of *Orchis*, *Habenaria*, *Epipogon*, *Spiranthes*, *Goodyera* and *Eulephia*. His *Ophrys* consisted of *Neottia*, *Corallorrhiza*, *Spiranthes*, *Listera*, *Liparis*, *Malaxis*, *Microstylis*, *Herminium*, *Aceras*, *Pterygodium* and *Disperis* in addition to the true *Ophrys*—a jumble indeed. He muddled the two distinct Tournefortian genera *Helleborine* and *Serapias* under the latter name—an illicit connexion which was at once challenged by Hill. Then he united under the name, *Ophrys insectifera*, all the true Ophrydes making the bee and the fly, etc., only varieties. Therefore if he took such a wide view of the species of *Ophrys* need we wonder that he regarded the numerous forms, hybrids, species, and varieties of the Marsh Orchids as forms or varieties of one very variable species. However, the criticisms of Haller and other correspondents and his own observations showed him that his first views needed considerable modifications. He was sufficiently great to alter his opinions when necessary. We, therefore, find in the second edition of the *Flora Suecica* of 1755 that he separates from the heterogenous mass included under *latifolia* in the *Sp. Pl.* two species, *O. sambucina* and *O. incarnata*, and he now gives to his residual *latifolia* this segregating character " folia parum maculata . . . nectarii labium retrorsum complicatum serratum, obscure trilobum " which does not fit *praetermissa* and this is emphasised when we see that in contrasting *incarnata* with his *latifolia* he says of *incarnata* " foliis pallidis viridibus immaculatis, nec saturate viridibus maculatis." This is very important because it is in these points that *praetermissa* also differs. Bearing on this point we may allude to Haller, a contemporary, a correspondent, and a critic of Linnaeus who, doubtless, was aware of what Linnaeus' matured conception of *latifolia* was. Haller's figure of *O. latifolia* L., 1334, does not represent *praetermissa* but a plant with spotted leaves and strongly reflexed labellum-lobes, and is probably the continental concept of *latifolia* although perhaps not precisely the *O. majalis* Reichb. One need not waste time in defending Linnaeus from the charge made against him of mistaking disease-marks for the natural dark spots on leaves of the Marsh Orchid. To sum up, may I say the description is the important part in defining a species, that figures, synonyms, and habitats may be helpful, but if these contradict the description, the description must have priority. What then is the answer to the question which forms the title to this note? We may confidently say that *sambucina*, *incarnata*, and *praetermissa* cannot represent *latifolia*, since the description does not apply. It may be *majalis* Reichb., or *purpurella* Steph., or it may be one of the hybrids of *maculata* with one of the members of the group *latifolia*. The retention of the name *latifolia* for any yet separated segregate seems as unwise as would be the attempt to use *Euphrasia officinalis*, *Viola tricolor*, *Rubus fruticosus*, or *Bursa pastoris* for any of their segregates. Those botanists with a " big thumb " may be content to ignore the critical species and may still cling to *O. latifolia* if it affords comfort, but any one engaged in phyto-geographical work or in systematic Botany may wisely drop the pilot and use a segregate name which means what it says, and has one meaning only.

2326. O. PURPURELLA Steph., Hybrids of. T. & T. A. STEPHENSON in *Journ. Bot.* 33, 1922. × *O. insignis* Steph. = *O. purpurea* × *latifolia*. Aberystwith and Arran. × *O. formosa* Steph. = *O. purpurea* × *ericetorum*. Ambleside and Arran. × *O. venusta* = *O. purpurea* × *O. Fuchsii*. Aberystwith, Ambleside, and Arran. × *Orchigymnadenia varia* = *O. purpurea* × *Gymnadenia conopsea*. Arran, with figure.

2327 (2). O. MACULATA Druce. Near Haile, Cumberland, June 1922, A. TEMPLEMAN. An extraordinary plant, with leafy bracts over an inch long, the petals narrow, and the labellum deeply cut, with the mid-division longer but narrower than the lateral, pale, pinkish, with faint markings. If *Fuchsii* and *maculata* grew there it may be × *transiens*.

2330. O. PYRAMIDALIS × O. MORIO. Ein neuer Gattungbastard. J. Braun-Blanquet in *Jahr. Nat. Ges. Graubünden* 167, 1921.

2338. HABENARIA GYMNADENIA. Under the title of Hybrids of *Gymnadenia conopsea* and *Coeloglossum viride* the Rev. T. and Mr T. A. Stephenson describe and figure this hybrid. It was first found at Winchester by Mr Jackson in 1909. (See *Rep. B.E.C.* 12, 1917.) One of the forms was sent by the late Mr R. F. Burton from Longner, Salop. *Orchid Review* 101, 1922.

2361 (3). SISYRINCHIUM STRIATUM Sm. Ic. Pict., t. 9. Alien, Chile, etc. Hortal. Highcliffe, S. Hants, 1922, ST JOHN MARRIOTT. An ornamental garden plant, doubtless planted here.

2425 (6). COMMELINA ELLIPTICA H. B. & K. Nov. Gen. et Sp. i., 259. Alien, tropical America. Introduced with chicken-food at Limpsfield, Surrey, 1922, Rev. E. C. CRUTWELL. The pretty Peruvian Spider Wort is a plant one would not expect to occur as an alien in Britain. It is figured as *C. gracilis* in *Bot. Mag.*, t. 3047.

2433. JUNCUS SUBNODULOSUS × LAMPROCARPUS = J. DEGENIANUS Boros in Maygar Bot. Lapok. 41-2, 1922. This should be sought for in Britain.

2473. LEMNA MINOR L. La fiotura della—nell' Orto botanico di Firenze by R. PAMPANINI & T. PROVASI. Bull. Bot. Soc. Ital.

2485. POTAMOGETON NATANS × POLYGONIFOLIUS, var. RICHTSFELDII Fisch., forma HIBERNICUS Hagström. Killarney, Kerry, August 1911, DRUCE. [Ref. No. 3006.] "This has been much written about and very interesting. It is a very distinct hybrid which I have named forma *hibernicus*. See *Crit. Res. Pondweeds* 193." Hagst., *in litt.*, 1921. It has masqueraded under other names, *i.e.*, *P. natans* L., var. *linearis* Syme. In *Rep. B.E.C.* 350, 1908, I referred it to *P. natans* × *polygonifolius*, and identified it with *P. gessnacensis* Fisch. Die Bayer Potam. 31, 1907. It is plentiful between the Upper and Middle Lakes of Killarney. Fryer's *crassifolius*, Hagström thinks is *gramineus* × *lucens* × *natans*.

2486. P. POLYGONIFOLIUS Pourr., var. CANCELLATUS (Fryer) Druce. Brousta, Shetland. Dr Hagström was very anxious to see specimens of this pretty plant, which he thought might prove to be a hybrid of *coloratus*. However, the plants I sent him induced him to state positively that it was not a hybrid, nor is *coloratus* known there. It is extremely local.

2488. P. COLORATUS Vahl, forma TERRESTRIS Tiselius. Black Pan, Isle of Wight, Miss PALMER in *Hb. Druce*; Cothill, Berks, DRUCE.

× GRAMINEUS = P. BILLUPSII Fryer. Also at Wood Walton Fen, Hunts, DRUCE.

2488. P. COLORATUS × PUSILLUS = P. PERPYGMAEUS Hagström, *in litt.*, ined. *P. lanceolatus* Sm., var. *hibernicus* Ar. Benn. The plant was discovered by Mr P. O'Kelly in the Cahir River, Co. Clare. In June 1907 it was shown me by him. It grew in a rapid stream in a limestone area, but I could not find any *P. gramineus* growing with it, but the water was turbid from floods so my search was not exhaustive. As I said in *Rep. B.E.C.* 476, 1909, it did not strike me as identical with the Anglesey plant. Dr J. O. Hagström examined my specimen and (*in litt.*, 1919) suggested that while one parent was *pusillus* he believed that the second one was *coloratus.* The latter species was not on record for that area. In September 1921, I took Mrs Wedgwood to this place vainly hoping it might be found in fruit. The Cahir stream was then beautifully pellucid and we shortly found the above Pondweed in profusion and in very much better condition than that obtained on my first visit. A careful search also resulted in finding *P. coloratus* in some quantity—small specimens only, so rarely fruiting—thus corroborating the shrewd suggestion of Dr Hagström. Supplies of both plants were sent him and although near his end he wrote "this hybrid which I, ad interim, name *P. perpygmaeus* is the most interesting Ireland owns. I will write a note on it in my new book about the Potamogetons." *P. perpygmaeus* is also the *P. lanceolatus* which was discovered by Mr Arthur Bennett in Burwell Fen, Cambridgeshire, in 1880. *P. coloratus* and its hybrid, *P. Billupsii*, also occur in that place. The reddish colour of *coloratus* is also present in *perpygmaeus* which thus differs from the beautiful grass-green of the Anglesey *lanceolatus.* *P. perpygmaeus* is, as yet, unrecorded from the Continent.

2489. P. ALPINUS Balb., var. OBSCURUS Asch. & Graebn. Syn.

i., 312. Canal, Shipley, York, J. CRYER. A common British form which is not recognised as a variety by Hagström.

2489. P. ALPINUS × POLYGONIFOLIUS = P. SPATHULATUS Schrader in Koch & Ziz. Cat. Pl. Palat. 18, 1814. *P. Kochii* Schultz Archiv. Fl. Fr. and Germ. 72, 1842. Hagström (*Crit. Res. Potam.* 148, 1916) says there are two forms of this hybrid :—one (a) *palatinensis*, with the lower leaves petiolate, and (b) *suecicus*, with sessile lower leaves. The lower leaves of both forms are long-petioled with petioles as long or longer (rarely shorter) than the blades with their sloping bases; apex obtuse, as in *alpinus*. The stem-anatomy shows influence from both the parent species and can be said to be intermediate. It is known from Broby, in Helgea, Scania, and from "Rhein-Pfalz, Kaiserslautern," Germany. (Norway is misreported by Graebner in *Potamog.* 133, 1907.) I am able to give it a wider distribution since Dr Hagström identifies a plant which I gathered in St Ouen's Pond, Jersey, in 1907, as this hybrid. It grows with *alpinus*, *coloratus*, and *polygonifolius*.

2493. P. GRAMINEUS × POLYGONIFOLIUS = P. SEEMENII Asch. & Graebn. Syn. Mittl.-Eur. Fl. i., 335, 1897. *P. gramineus*, forma *lanceolatifolius* Tis. Exsicc. Suec. n. 139. Two forms are described by Hagström in *Crit. Res. Potamog.* 232—namely, a *lanceolatifolius* (Tis.) Hagstr. and *subcuspidatus* Hagstr. The plant gathered by Seemen at Borkum more nearly approaches *gramineus* but of the two forms mentioned above, *lanceolatiformis* occurs in the rivers Alsteran and Eman, and *subcuspidatus* at Pinneas in Scania. A doubtful plant gathered by Coles in Scotland may possibly belong to this. "The submerged leaves are very characteristic, their base, lanceolate, with a short stalk, or with the lamina narrowly decurrent as far as the insertion, often with a conspicuous, waist-like contraction between the stalk-like part and the blade; margin often untoothed but, sometimes from the same locality, a very faint rudimental serrulation at greater enlargement grows visible; apex equally tapered (*polygonifolius*) and mostly sharp (*gramineus*). Also the structure and nervation are intermediate." Last September Mrs Wedgwood and I made a somewhat adventurous journey to Ireland just after the truce. We visited and searched the River Laune below Killarney and near Ballymalis Castle in search of

Equisetum trachyodon, and dredged some Pondweeds which grew plentifully there. One of them was a new form evidently allied to *gramineus*. I sent a gathering to Dr Hagström (whose death we so greatly deplore), and although on a sick-bed he kindly identified them with the above hybrid, which is thus for the first time identified from the British Isles. My plants belong to the var. *lanceolatiformis*. G. C. DRUCE.

2495. × P. NITENS Web. (GRAMINIFOLIUS × PERFOLIATUS), var. SUBPERFOLIATUS Hagstr., forma FLUMINEUS Hagstr. This differs from the variety by its larger, cordate, submerged leaves, 80 x 12 cm. I found it in Loch Spiggie, Shetland, in 1921. Plants distributed this year. G. C. DRUCE.

2503. P. CRISPUS × PERFOLIATUS = P. COOPERI Fryer, var. SERRATUS Hagstr. This differs from Fryer's type *Cooperi* by the ' folia serrato-dentata.' Hagstr. *Crit. Res.* 62. The plants grew in the Canal at Lichfield, Stafford, with *P. Lintoni*. G. C. DRUCE.

2505. P. ACUTIFOLIUS × PUSILLUS = P. SUDERMANICUS Hagstr. Ditch, near Camber Castle, E. Sussex, 1900, C. E. SALMON. See Arth. Bennett in *Journ. Bot.* 55, 1922.

2508 (2). P. FOLIOSUS Rafinesque in Med. Repository, v., 354, 1808. *P. pauciflorus* Pursh Fl. Am. Sept. i., 21, 1814. Alien, N. America, Canada, Nova Scotia to California, Jamaica, Cuba. Discovered by W. S. M. D'URBAN in the deep water of Canal Double Locks, near Exeter, on 18th August 1921. This is the second alien Pondweed in Britain. Another alien aquatic grows in the Exe, near Exeter, *Sagittaria heterophylla*. G. C. DRUCE.

2511. P. INTERRUPTUS Kit. = P. FLABELLATUS Bab. Hagström has seen all my most characteristic specimens of Babington's *flabellatus*. He refers them to *P. pectinatus* L., *in litt.*, 1921. In *Crit. Res.* he says (p. 41) that " it may nowadays by all investigators be acknowledged to be a *pectinatus* form." Our strong form from the Thames he names var. DIFFUSUS, forma PINGUIS Fisch. Cherwell, Oxon; canal, Wantage, Berks; River Wey, Surrey, etc.

2612. CAREX CANESCENS × STELLULATA. O. EKLUND in *Meddel. Soc. Faun. et Fl. Fennica* 95, 1921. This I have gathered on Ben Lawers, and I saw it in Norway in 1922.

2614. C. MURICATA and C. PAIRAEI. See note by A. W. STELFOX in *Irish Nat.* 31, 1921.

Gen. 635 (1). PASPALUM L.

2631 (10). P. RACEMOSUM Lam. *P. stoloniferum* Willd. Alien. Bristol, Mrs SANDWITH. Det. W. B. Turrill.

2635 (10). PANICUM TERNATUM (Stapf) Druce, nov. comb. *Digitaria ternata* Stapf in Dyer Fl. Cap. vii., 376. Alien, South Africa. Bradford, Yorks, 1917, coll. J. CRYER.

2645. ZEA MAYS L. Inheritance of the Ramose Inflorescence in Maize. J. H. KEMPTON in U.S. Dept. of Agric. Bulletin 971, December 1921. The branched-ear variation is the *Zea ramosa* Gernert in *Amer. Nat.* v., 46, n. 550, 616-622. Behaves generally as a simple, Mendelian character recessive to the normal condition.

2662. ALOPECURUS PRATENSIS L., var. CAESIUS A. Schwarz. [Ref. No. 2494]. Pasture, West Barnes, Merton, Surrey, June 1922. Distinguished by reason of the glaucous stems and sheaths, the latter more inflated than in the type. C. E. BRITTON.

2662. A. PRATENSIS L., forma MASONII mihi. This differs from the type in the much longer anthers. They protrude so far as to give the panicle a look of *Plantago media*. Melmerby, Cumberland, Rev. W. WRIGHT MASON. In the Scottish plant the anthers are longer than those in the common British form. This, too, is usually the case with *Phleum pratense*. G. C. DRUCE.

2673. PHLEUM PRATENSE L. Under the name, Timothy Grass (*Farmers' Bulletin*, n. 1254, U.S.A. Dept. of Agric.), this grass is said to be by far the most important hay grass cultivated in America, the quantity grown being four times as great as of all other hay grasses. As early as 1807 it was the most important hay grass. It is acknowledged to be an introduced species from Europe. The specimen figured seems to be the Scotch Timothy which is closely related to, if not identical with, the form or variety *P. intermedium* Jord. in that it has, at the base, one or two thickened internodes each of which is of annual duration. The number of seeds in a pound of Timothy is 1,200,000, and a bushel weighs from 42-60 pounds.

2684. AGROSTIS ALBA L. *A. palustris* Huds. (*Farmers' Bulletin*, n. 1254, *l.c.*). In this work it is called "Redtop." It was early introduced into the American colonies. "No other grass will grow under as great variety of conditions as Redtop." Most of the seed is produced in Illinois. It is smaller than that of any other commercial grass, a pound containing 4,000,000 seeds and a bushel of the chaffy seeds weighs 14 lbs., but when recleaned as much as 36 pounds.

2685. A. TENUIS Sibth. (*Farmers' Bulletin*, p. 33, *l.c.*). The Rhode Island Bent, the American name, according to Mr Piper, is the most common and abundant grass on well-drained soils in New England and New York, but it is believed that it was introduced from the Old World. It thrives best on acid soils, as it does in Britain. Dr Thellung has recently shown that its more correct name is *A. capillaris* L.

2702. AMMOPHILA ARENARIA Link, var. (vel forma) nov. RAMOSA. Found by Mrs WEDGWOOD, in August 1922, at Yarmouth, E. Norfolk. It differs from the type by its lax, compound panicle, the lowest branch reaching to about midway of the five-inch inflorescence. There is no suggestion of hybridity. G. C. DRUCE.

2717. AVENA. Under the title of "Varieties of Oats in Cultivation," Mr C. V. B. MARQUAND has contributed a valuable paper which is printed in a *Report of the Welsh Plant Breeding Station*, series 6, n. 2, 1922; price 5s 6d. A paper on *A. strigosa* Schreb. and its forms has already been published in the *Report*. In addition, Mr Marquand gives *A. brevis* Roth, a continental oat, readily distinguished from *strigosa* by its very short grain, 7-11 mm. in length. Of *A. fatua* he gives three varieties :—(1) PILOSISSIMA Gray. Young plant prostrate; tillering capacity very great; frequently as many barren shoots formed as those producing panicles; leaf-sheaths pubescent; lamina long; marginal hairs extending from the base up to ½-¾ of its length; ripe grains dark brown, 14-18 mm. in length; a dense tuft of brown hairs, 1.5-4 mm. long, on the upper part of the callus surrounding the sucker mouth. (2) PILOSA Druce. Differs from var. PILOSISSIMA in the character of the grain, which becomes olive-coloured when ripe, and is very sparsely covered with pale yellowish hairs from the base to the point of attachment of the awn; a tuft of pale grey hairs, 1.0-2.0 mm. on the callus. (3) GLABRATA Peterm. Young plants prostrate to sub-erect; marginal hairs usually extending up the lamina to near the apex. Agreeing with *pilosissima* in other characters except in the grain which is somewhat broader than in that variety, becoming pale yellowish on maturity. The callus bears a dense, circular tuft of spreading, whitish hairs, 2-3.0 mm. long. Mr Marquand remarks that this variety, which has been known for some years, may have originated as a mutation from one of the earlier, cultivated varieties with solidified, basal articulation (*A. sativa*) and is thus really a wild base. Dr Thellung, I believe, considers it to be a hybrid of *A. fatua* × *sativa*. *A. sativa* is distinguished from *A. fatua* by the absence of awns on the upper grains and by the attachment of the grain. Of this he gives two new sub-species—VERNA and AUTUMNALIS—and under it he also places, as a sub-species, A. ORIENTALIS (Schreb.). The very numerous cultivated forms are fully described. A. NUDA L., with four varieties, is given. The Oilcorn, as it was called, is no longer cultivated in Britain. A. STERILIS L. has two varieties, *i.e.*, var. MAXIMA Perez Lara and LUDOVICIANA Gillet. The latter appears as a casual in Britain. It differs from the type in having only two, or rarely three, grains in the spikelet (type 3-5), the glume is 16-19 mm. long (type 35-52) by 5.5-7.0 mm. broad (type 9-12); grain 16-19 mm. long (type 32-38). The awn in both is long, geniculate, and twisted. Of this there is also a sub-sp. CULTA. Several varieties are given. Some good photographic illustrations are appended.

2724. ARRHENATHERUM ELATIUS (L.) Beauv. (*Farmers' Bulletin*, n. 1254, p. 18, U.S.A. Dept. of Agric.). Tall Meadow Oat-grass. The seeds, which are of low vitality, go 150,000 to a pound, and a bushel weighs 10-16 pounds. Nothing in the Bulletin is said about *A. tuberosum*. It became established in the States about 1807.

2727. CAPRIOLA DACTYLON Kuntze. (*Farmers' Bulletin*, n. 1254, *l.c.*). Under the faulty name, *Cynodon Dactylon* L., the Bermuda Grass is described as being the most important grass in the South where it shows a marked preference for clayey soils. Three well marked varieties occur. Good seed is produced in Arizona, California, and Australia. 1,800,000 seeds go to a pound and a bushel weighs from 35 to 36 pounds. With regard to the name Linnaeus called it *Panicum*, not *Cynodon*, a genus which we owe to Persoon, who established it in 1805, but Adanson, in 1763, had named it *Capriola*. It is one of many instances of an improper name being conserved by the Vienna Actes.

2751. DACTYLIS GLOMERATA L. (*Farmers' Bulletin*, n. 1254, *l.c.*) Under the name, Orchard Grass, it is said to grow in nearly every State in the Union, but there is no great demand for it. The number of seeds in a pound is half a million, and a bushel only weighs 14 pounds.

2759. POA PRATENSIS L. Kentucky Blue Grass. (*Farmers' Bulletin*, n. 1254, *l.c.*). Next to Timothy in importance in the States comes this grass. Like Timothy it is an introduction from the Old World. Although it does best on limestone it is not peculiar to that soil. Each pound contains 2,400,000 seeds, and a bushel weighs 14 pounds. It would be interesting to see which form of *pratensis* is referred to. The name suggests it may be *subcærulea*.

2761. P. TRIVIALIS L., var. SEPTENTRIONALIS Druce Fl. Zetl. 539, 1921. Characterised by its larger florets with purplish black outer glumes. The plant has numerous offsets above the surface so that it gives more foliage than the common forms. The florets are about 20 per cent. larger than those of the common midland plant. Specimens distributed this year. Tingwall, Lerwick, Balta. Burrafirth, etc., Shetlands, G. C. DRUCE.

2761. P. TRIVIALIS L., var. STRICTA Döll. Cultivated field, Lower Morden, Surrey [Ref. No. 2502], June 1922. This is similar to the var. *rigidior* Fl. Ingr. (see *Rep. B.E.C.* v., 56, 1917), but Döll's name is probably earlier.

2765. P. COMPRESSA L. (*Farmers' Bulletin*, p. 17, *l.c.*). The Canada Bluegrass, as it is called, was introduced from Europe and is largely grown in Canada. Although undoubtedly inferior to *P. pratensis* it is of much more importance than agricultural writers generally admit, and will do better than *pratensis* on stiff clays, but is suited for pasture rather than for hay. 2,700,000 seeds go to a pound, and a bushel weighs from 14 to 24 pounds.

2776 (2). PUCCIANELLA FESTUCIFORMIS (Hayne). In *Suppl. Fl. Cornw.* 155, 1922. This is recorded from Egloshayle Marsh, 1918, by E. THURSTON and named by Dr Stapf. The grass is so critical that, despite the high authority as to its name, until one has seen a series of it I hesitate to accept an Adriatic plant from Cornwall as British when its very close ally *P.* or *G. maritima*, var. *hibernica* occurs in Ireland, Dorset, Hants, Sussex, and Kent. Even *festuciformis* may not be specifically distinct from *maritima*.

2781. FESTUCA ARUNDINACEA Schreb. Mr T. F. JENKIN has sent a note saying that in making a critical examination of this and its allies he finds *arundinacea* has the ledge of the auricle (*i.e.*, the margin) fringed with rather stiff hairs. The *pratensis* types have no such hairs. This fact does not seem to be previously recorded. Will members kindly assist in seeing if this is usually the case?

2782. F. ELATIOR L. (*Farmers' Bulletin*, p. 20, *l.c.*). As Meadow Fescue or English Bluegrass has not received due attention in the States. Mr Piper says *F. pratensis* and *elatior* are merely medium and tall varieties of the same species. The seed of *elatior* is highly germinable and 240,000 go to a pound, and a bushel weighs 25 pounds.

2785. F. RUBRA L. (*Farmers Bulletin*, n. 1254, *l.c.*). In the States it is used mainly as a lawn plant, and there are two varieties, one, the type, and the other, "Chewing's Fescue from New Zealand," which Mr Piper calls *F. rubra fallax*, but whether it is the *F. fallax* of Thuillier is conjectural. Half a million of seeds go to a pound, and a bushel weighs 10-15 pounds.

2786. F. OVINA L. (*Farmers' Bulletin*, p. 27, *l.c.*). It is said to be native of the Great Lakes area and along the Rocky Mountains. It is an excellent grass to grow on poor, sandy soil, while the bushel of seeds weighs about the same as those of *F. rubra*. The seeds are smaller as a pound contains 680,000.

2823. LOLIUM MULTIFLORUM Lam. (*L. italicum*). (*Farmers' Bulletin*, n. 1254, p. 30, *l.c.*). Under the name, Italian Rye-grass, it is said to be not truly an annual, but under farm conditions few of the plants live more than one year, and the yield of it is much less in the States than in Europe. 280,000 seeds go to a pound, and a bushel weighs 24 pounds. Under *L. italicum* the name of the author is given as Robert Brown. This is not so, the author is A. Braun. It is not quite certain that *L. multiflorum* and *italicum* are synonymous. The former is supposed to be the wild plant, *italicum* the cultivated form. *L. Boucheanum* Kunth, 1829, is earlier than Braun's name.

2824. L. PERENNE L. (*Farmers' Bulletin*, p. 32, *l.c.*). The Perennial Rye-grass is also known in the States as English or Australian Rye-grass. It is said to be the first of all perennial grasses to be grown in pure culture for forage in England in the seventeenth century. The seed germination is good. 280,000 go to a pound and a bushel weighs 20 pounds.

2848. HORDEUM NODOSUM L. (H. SECALINUM Schreb.), ? var. BREVISUBULATUM (Trin.) Thellung. *H. secalinum* Schreb., var. *brevisubulatum* Trin. Sp. Gram. 1, t. 4, 1828. Planta paulla nota e Sibiria descripta. Det. A. Thellung, March 1922. Greenford, Middlesex [Ref. No. 1757], coll. J. E. COOPER; comm. G. C. BROWN.

2860. JUNIPERUS COMMUNIS L. Om variations formagan hos eren *Meddel. Soc. Faun. et Fl. Fennica* 11-15, 1921.

2862. TAXUS BACCATA L. The size of Yew Trees. J. RENWICK in *Garden* 205, 1921.

2862. T. BACCATA L., var. FASTIGIATA Loudon. The Irish Yew is generally (? always) female. It is said to have originated as a mutation in Fermanagh, and if the Irish Yew trees grown in England have all been propagated by cuttings the sex-character would be explained. See C. J. BOND in *Nature* 810, 1922, who asks for male examples of the Irish Yew. He has young plants raised from the berries of *fastigiata* fertilised by pollen from the type *baccata*. These are as yet barren but show a graded series from the Irish to the English Yew.

2865. LARIX DECIDUA Mill. In the *Gardeners' Chronicle* for May 20, 1922, p. 258, Mr A. D. RICHARDSON treats of the introduction of the Larch into Britain. The popular idea is that the Dunkeld Larches were the first to be planted. One of these still remains. The other was blown down prior to 1911. The members of the Phyto-Geographical Excursion were photographed standing round the base of the trunk. It was said by Loudon to have been planted in 1727, and the popular version is that the Larches were first treated as greenhouse plants, but were thought to be dying and were thrown on a rubbish-heap where they took root and soon became vigorous. But another claimant for precedence came in for Dick Lauder says the Larches at Dawick, Peeblesshire, were said to have been planted in 1725. Mr Richardson, however, states that the Larches at Arniston House, in Midlothian, overlooking the South Esk, about 500 feet above sea level, were planted in 1738, and are smaller than the Dunkeld trees, girthing, as they do, 11 feet at five feet from the ground. From the Arniston Memoirs he is led to believe that the Dunkeld trees were planted in 1727, but whether before or after the Dawick trees is uncertain.

2878. BLECHNUM SPICANT With., var. BIFIDUM Wollaston. Leith Hill, Surrey [Ref. No. 2537], August 1922, C. E. BRITTON.

2878 (2). B. TABULARE (Thunberg) Kuhn Fil. Afr. 94. 1869 = LOMARIA MAGELLENSE Desv. Alien, S. America, etc. A specimen was sent me by Mrs THOMPSON which had been gathered near Megavissey, Cornwall, by Dr BALGARNIE. Doubtless planted.

2907. POLYPODIUM VULGARE L., var. SERRATUM Moore. [Ref. No. 2556]. Lane between Gate Cottages and Beckley Furnace, E. Sussex, September 1922, C. E. BRITTON. See *Our Native Ferns* i., 38, f. 18, where it is recorded for Hereford, and near Hutton Railway Bridge, Malton.

2924. ISOETES. Anatomie und Systematik der Gattung Isoetes U. WEBER in *Hedwigia* 219-40, 1922.

2932 (3). SELAGINELLA DENTICULATA Link fil. Sp. H. Berol. 159. Alien, Mediterranean region, etc. Hortal. Well established in an orchard at Landewednack, Cornwall, H. DOWNES. See *Rep. B.E.C.* 586, 1921.

NOTES ON PUBLICATIONS, NEW BOOKS, ETC., 1922.

(*Owing to exigencies of space and the erratic receipt of foreign works this is necessarily incomplete.*)

ADAMSON, R. S. Studies of the Vegetation of the English Chalk —I, The Woodlands of Ditcham Park, Hampshire, in Journ. of Ecol. 113-219, 1922.

AMES, O. ILLUSTRATIONS AND STUDIES OF THE FAMILY ORCHIDACEAE. The Orchids of Mount Kinanulu, British North Borneo. Note on Phillipine Orchids. Royal 8vo., tt. 22, pp. 335. Wheldon & Wesley, London, 1922; 50/-.

ARMITAGE, ELEANORA. The Twenty-seventh Annual Report of the Moss Exchange Club, June 1922. The Treasurer writes in the *Report*, " It is evident that two [Moss Exchange] Societies are a source of weakness instead of strength," and it has been impossible to complete the " issue of new editions of the Census Catalogues of the Club." Perhaps the establishment of the combined bryological society may solve the difficulty.

AULIN, Fr. R. En flikbladig form av *Rhamnus Frangula* L., in Svensk Bot. Tids. xvi., 301-302, 1922.

BABINGTON, C. C. MANUAL OF BRITISH BOTANY. Tenth edition; edited by A. J. WILMOTT. Gurney & Jackson, London; pp. liv., 612, 1922; 16/-. In the Seventies and Eighties the publication of a new edition of "Babington" caused great excitement among British botanists. Each edition, the result of personal work, was well brought up to date. Every page showed the careful attention given to it by the author, who kept himself in touch with contemporary botanists. He was, besides, an acknowledged referee on Rubi. But Babington has long passed away. His personal influence is only in the memory of a few, and some of the few have lost touch with their common subject. So that now the *Manual* has to appeal to a different set of readers. Vast changes in nomenclature have taken place and different views as to the grades of plants are now held. Mr A. J. Wilmott has edited the present edition which the publishers have produced in a very compact form, so that it is especially convenient for the field-botanist. Considering the cost of printing and binding the price, 16/-, cannot be called dear for its 666 pages. No mention is made of the previous edition, which was so ably edited by Messrs Groves. This omission seems almost unaccountable, unless it was owing to Mrs Babington, the somewhat arbitrary possessor of the copyright, whose frame of mind respecting the sanctity of the descriptions and names used in the *Manual* was so peculiar that it led to the 9th edition being less valuable than would have been the case had the Editors been allowed a clear hand. One is somewhat surprised in the circumstances to see such innovations in nomenclature as are now made, while the retention of the hoary errors of the old editions are still perpetuated. The practice is retained of enclosing the name of the author of the species in brackets, which is not only contrary to universal custom, but also conveys an entirely false impression—as if, for example, *Ranunuculus Lingua* (L.) was either established as a variety or under some other generic name by Linnæus. The innovation is, perhaps, worth discussing. One feels sure that the citation of '*Lychnis dioica* L., em. Mill.,' '*Papaver dubium* L., em. Lamotte,' '*Arenaria serpyllifolia* L., em Guss. would have been repugnant to Babington. The greatest debt botanists owe to Linnæus was his introduction of the consistent use of binomial names. In the days of the herbalists, when the known species of plants were few, and when no dominant system of classification was in use, plant names were more or less descriptive and were often lengthy. As one sees from the MSS. of the Dillenian *Pinax*, botany was being strangled by the exuberance of its lengthy names of plants. Linnæus had the intuition to see that by using a binomial name an enormous amount of writing would be saved, and a heavy tax upon the memory would be avoided. And with few exceptions, and these were only of a temporary kind, the change was welcomed and adopted. For a century and a half the beneficent reform has been enjoyed. Unfortunately in the hasty proceedings at Vienna in endeavouring to avert undue creations of new names, the introduction of a ternary method was, if not enforced, at least made permissible in cases where there is an obscurity of definition, or where ' species ' covered more than one, or in cases where two species were combined under an old name. See Art. 44 where, surely, the intention is to use a second author's name only in such cases which were absolutely necessary. Although examples of species only are given it applies to genera which are more fluid than species. See also Art. 41 where it is suggested (I think most unwisely) to write *Globularia cordifolia* L. " excl. var b.," while Art. 40 says it is necessary to quote the author who first published the name. One may ask—does such a citation as *Ulex europæus* L., " em. Roth," or *Genista tinctoria* L., " diagn. em. Willd." really help botanists? Those who have only an elementary knowledge of nomenclature—itself not a popular subject—have enough to do to remember the authority for the name. As to where Roth or his emendations are to be found is beyond him. Nor will such works as are at his disposal assist him. He who is better informed as to the methods and limitations of Linnæus does not want to be told. He knows that the descriptions in the *Species Plantarum* are often inadequate or even incorrect, that they may differ from his herbarium specimens, and that the synonyms often do not apply. In the majority of cases, however, it is not difficult to fix the species name or the type. With regard to every species that has been described, our knowledge of it is not final, and there is no reason to add a second authority, because, if not already, it may be only to-morrow that another emendator may have to be recognised. Again the mere citation, " emend. Reichb." is quite inadequate. One wants to know which Reichenbach and in which work this so-called emendation occurs. The monumental *Index Kewensis* or *Genera Siphonogamarum* would give no help. In field botany, both in Britain and elsewhere, plants are often spoken of by the specific name. Therefore the highest importance must be put on the retention of the original trivial. The exceptions to this rule should be of the fewest. Personally I should accept (as is done by the American school and by zoologists) duplicated names such as *Coronopus Coronopus* rather than wander about in a quagmire of *C. Ruellii*, *C. verrucarius*, *C. procumbens*, *C. squamata*, &c., all of which would have been avoided by the duplication of the trivial, even if for a moment the risibility of Engler's students had to be faced. One might " have heard the smile " but it would have been as evanescent as the choice of some of the foregoing alternatives. So, too, the so-called " totgeborenen " names might have been allowed resuscitation, or rather need not have been strangled as they somersaulted into the world. In the field we talk of *Filix-mas* and give comparatively little heed as to whether it is associated with Schott, Richard, Presl or Swartz, and the coupling of each of these authors with " emend. someone " causes annoyance and creates an exactly opposite effect to what is the true aim of nomenclature. Art. 3 states, " The rules must be simple and founded on considerations clear and forcible enough for every one to comprehend, and be disposed to accept," and in Art. 4 the essential points are (1) to aim at fixity of names; (2) to avoid the use and forms of names which may cause error or ambiguity, or throw science into confusion." In a monograph of a genus such details can be supplied, if thought necessary, but for every day citation it is a waste of time and space and has no compensating advantages. For instance, why write " *Lotus corniculatus* L., emend. Reichb." when for the last 50 years *L. corniculatus* L. has practically meant the same thing the world over. In an ordinary British Flora a description of *L. corniculatus* L. would be given and if it is worth a tinker's curse the description there should be adequate to distinguish it from its allies without any reference to Reichenbach or other author. There is only one thing worse than the employment of this method, and that is its erratic employment. Why write *Matricaria inodora* L. without an emendation? Why, as in the *Manual*, should *Spiræa*, *Daucus*, *Conium*, and *Viscum* all be ascribed to Linnæus without an " emend."? *Viscum* L. consists of plants now referred to five different genera, and the others are in the same category as many of those which are cited L., emend. So, too, among others, *Achillea*, which includes also species of *Lonas*, *Pyrethrum*, and *Tanacetum* is simply cited " L." while *Anthemis* L. is "emend. Koch." Enough has been said. It may be that some may like the method but I am old-fashioned enough to dislike a plan which adds to difficulties and affords no help. One wishes that the time spent on adding these 'emends,' and it must have been quite considerable, had been given to correcting errors and in amplifying the information in the text. How strangely inadequate are the statements that *Matricaria discoidea* is " established in many parts of Ireland, Cornwall, and elsewhere," that *Diotis* is " extinct in England," or the references to *Senecio Cineraria*, *S. squalidus*, and other species. Among the new combinations is *Vicia varia* (Wilmott) which, it is suggested, should replace *V. gracilis* Lois., on the faith of Brotero's *Ervum varium*, published in the *Flora Lusitanica* of 1804 which appears to be the earliest trivial. If Mr Wilmott means consistently to use the oldest trivial I welcome it. According as I read the existing rules the trivial is invalid since there is already a *Vicia varia* Host. established in *Flora Austriaca* in 1836—a combination earlier than 1922. The adoption of the permanency of the oldest trivial (under whatever genus it may have been established) as against a combination of a more recent date in which that trivial is used might possibly cause an alteration of 200-300 names but its adoption would do away with another of those troublesome exceptions which make botany so burdensome.

Mr Wilmott has ably described the additions in the Appendix II., where he says only " the more important advances are noticed," but, following Babington's practice their sources might have been supplied. They include *Ranunculus Aleae* Willk. (which perhaps should be Moss not Willkomm since true *Aleae* awaits discovery in the place where it was said to be a feature). Specific grade is given to *Nymphaea occidentalis* Moss which Ostenfeld named as a variety. It has not yet been shown conclusively that it differs from De Candolle's var. *minor*. It certainly differs from the standard of species set in the *Manual*. It has been questioned if the Yorkshire and Lancashire plants belong to *Sagina Reuteri*. Specific rank, again, is given to that exceedingly thin plant *filicaulis* as apart from *Alchemilla minor* Huds., which rejoices as "*A. minor* Huds., not of Lindb., not of Buser, and other continental botanists." Under *M. piperita*, Linnaeus is given as the author although he made it a species, not, as it is now considered, a hybrid, and that is a great emendation. It is suggested that *Arctium vulgare* should be replaced by *A. intermedium* Lange. But is not the older and correct name *A. nemorosum* Lejeune? Among the numerous omissions are *Nitella spanioclema* and *Tolypella nidifica*. *Euphrasia suecica* is not noticed although Wettstein and the Swedish botanist named my plants as they did those of *E. fennica*. At least they are as good an authority as those who suggested the latter was a slender *E. Rostkoviana*. Linnaeus did not describe *E. minima*. E. S. Marshall is incorrectly given as the authority for *Rhinanthus borealis*, *monticola* and *Drummond-Hayi*. I placed these plants, which had been called *Alectorolophus* by Sterneck, in the Ann. Scot. Nat. Hist. 178, 1901, not in synonymy, as is wrongly stated in Ind. Kew. Supp. 216, 1911-15, but as "three new British species of Rhinanthus," thus much antedating Mr Marshall's transference of them to the same genus. This he acknowledges in the tenth edition of the *London Catalogue*. *Rhinanthus stenophyllus*, which is attributed to me, is to be found in the Index to Schur's work (in the text, if I remember rightly, he called it a variety). I do not claim to have 'emended' *Orchis maculata* L., the description in the *Species Plantarum* is precise enough to distinguish it from *Fuchsii*. Indeed it is more precise than the description of *Crataegus Oxyacantha* in the same work which is used by continental botanists in the sense of *oxyacanthoides*. Under *Potamogeton rutilus* Shetland might have been added. The trivial, *Habenaria chloroleuca*, is still retained notwithstanding there is an earlier combination of that name. *H. virescens* retains the oldest available trivial. There are no references to *Glyceria festuciformis* or to *Plantago Sabrinae*. Under the Elms we have an example of making a fetish of a trivial. The name, *Ulmus campestris*, has been interpreted in so many ways that its use is only a source of confusion. Linnaeus meant practically any European Elm. The specimen in the herbarium is not the English Elm. Nor are the synonyms given or the habitat that of the

English Elm. What is it that is sacrosanct? It was (wrongly as I think) sought to fix the name *campestris* by a reference to Ray's *Synopsis* in the *Flora Anglica*—a work which should be outside the pale of citation for binomials. In the *Manual* it is cited "*U. campestris* L., emend. Bab." But Smith (*Comp. Fl. Brit.* 40, 1800) had already used it for our British Elm. He only had two species, while continental authors had used it in quite a different sense. If *campestris* be retained for the English Elm it involves "*U. campestris* L., non syn. nec habitat nec Herb., emend. Sm., Bab., Henry, Moss, not of Kerner et auct. var." It would be much wiser to describe under a new name such as *U. anglica* our English Elm, since the arboriculturists who have most closely studied it ascribe it to two different species of Miller. Both cannot be correct. Other names are in this category—*Rubus fruticosus*, *Ranunculus aquaticus*, *Ophrys insectifera*, and *Orchis latifolia*. Their retention only leads to confusion. In such cases, and perhaps in the case of *Rosa villosa*, which I believe was given as an illustration in the Vienna Actes, the sentimental reason for retention is outbalanced by the advantages of using a name free from ambiguity and which requires no qualification, emendation, or gloss.

The Manual thus gives us much to ponder over and to give a kindly thought to the veteran botanist, almost the last of the professional systematists, who compiled it and who, although he ran the gauntlet of severe criticism, bore it manfully and was always willing to correct any mistake he might have fallen into, or to add anything to his descriptions which he thought would render them of greater assistance.

It may be well to give the dates of the various editions of the *Manual*. Ed. 1, pp. 400, 1843; ed. 2, pp. 428, 1847—(mine is Prof. Lawson's interleaved copy with Durham notes); ed. 3, pp. 434. 1851; ed. 4, 1856; ed. 5, pp. 448, 1862; ed. 6, 1867; ed. 7, pp. 472, 1874; ed. 8, pp. 485, 1881; ed. 9, edited by H. & J. Groves, pp. 580, 1904; ed. 10, edited by A. J. Wilmott, pp. 621, 1922.

BAILEY, L. H. THE APPLE TREE. pp. 117. Macmillan & Co., Ltd., New York and London, 1922; 7/-.

BATESON, Prof. W., F.R.S. Lecture given before the American Association for the Advancement of Science at Toronto, December

21, 1921. The conclusion of an admirable lecture was occupied in an appeal to systematists. "Only those who are keeping up with these new developments can appreciate fully their vast significance or anticipate the next step. That is the province of the geneticist. Nevertheless I am convinced that biology would greatly gain by some co-operation among workers in the several branches. I had expected that genetics would at once provide common ground for the systematist and the laboratory worker. This hope has been disappointed. Each still keeps apart. Systematical literature grows precisely as if the genetical discoveries had never been made, and the geneticists more and more withdraw each into his special 'claim'—a most lamentable result. Both are to blame. If we cannot persuade the systematists to come to us, at least we can go to them. . . . Both we and the systematists have everything to gain by a close alliance. Of course we must specialise but I suggest to educationists that, in biology at least, specialisation begins too early. In England certainly harm is done by a system of examinations discouraging to that taste for field natural history and collecting, spontaneous in so many young people. . . . With us attainments of that kind are seldom rewarded, and are too often despised as trivial in comparison with the stereotyped biology which can be learned from text-books. Nevertheless, given the aptitude a very wide acquaintance with nature and the diversity of living things may be acquired before the age at which more intensive study must be begun, and is the best preparation for research in any of the branches of biology. The separation between the laboratory men and the systematists already imperils the work, I might almost say, the sanity of both."

Beauverd, G. Phanerogamarum Novitates. Bull. Bot. Soc. Genev., 10, 1921.

Beck, G. Plantae Europaeae hactenus non indicatae. Fedde Repert. 449, 1921.

Beck-Mannagetta. Orobancheae Novae. Fedde Repert. 33-40. 1922.

Bennett, Arthur. *Hippophae Rhamnoides* L. and its Names. Naturalist, 157-158, 1922. *Statice* and *Atriplex* in Lincolnshire.

Naturalist 197, 1922. *Pyrola rotundifolia* Linn., in Caithness, with Notes on the Genus, in *Trans. Bot. Soc. Edin.*, vol. xxviii., pt. 2, 71-6, 1921.

BITTER, G. Zur Gattung *Physalis*. Fedde Repert, 5-7, 1922.

BLATTER, Prof. E., and D'ALMEIDA, Prof. J. F. THE FERNS OF BOMBAY. 8vo., pp. viii., 228. Taraporevala & Sons, Bombay, 1922; 7.8 rupees.

BLOMEFIELD, LEONARD. A NATURALIST'S CALENDAR KEPT AT SWAFFHAM BULBECK, CAMBRIDGESHIRE. Edited by Sir Francis Darwin. Camb. Univ. Press, 1922; 3/6.

BORNMULLER, J. New Species and Forms of *Filago* from Persia, Palestine, and Egypt. Fedde Repert, 40-43, 1922.

BRIQUET, J., and CAVILLIER, F. Autobiography of Emile Burnat, 1828-1920. Published at the Conservatoire Botanique, Genève, 1922. Burnat was the author of the excellent *Flore des Alpes Maritimes*. His large Herbarium contained over 200,000 sheets.

BRAIN, W. J. The Big Tree of Tule, in Kew Bull. 199, 1922. *Taxodium mucronatum* Tenore. Kew possesses three trees presented by Mr H. J. Elwes, which are now 7 to 9 feet high. They resemble *distichum*, but are not at Kew completely deciduous. In the Museum, No. 3, there are two good photographs of the tree at Tule taken by Mr Thos. C. Ellis in 1898. I have one given me by Lord Farrer. The Gardeners' Chronicle (350, 1867) says this tree at Santa Maria di Tula, in Oaxaca, had a circumference of 117 feet 10 inches, and was variously estimated at 6000, 5352, and 3882 years old.

BRANDRIS, Sir DIETRICH. INDIAN TREES. 8vo. Constable & Co., London, 1921; 40/-.

BRITTEN, JAMES. Friedrich Ehrhart and his Exsiccatae. Journ. Bot. 318, 1922. A valuable contribution to the history of this important set.

Britton, Nathaniel Lord. Studies of West Indian Plants, X. Contrib. New York Bot. Garden, No. 236, pp. 327-43, 1922. Contains 37 new species from Trinidad; 4 from Jamaica; 6 from Cuba, and one, *Tournefortia barbadensis*, from Barbados.

Britton, N. L., and Rose, J. N. The Cactaceae. Vol. iii., 4to., pp. vii., 255, tt. 24. Carnegie Institute of Washington, 1922.

Brown, N. E. *Mesembryanthemum* and Some New Genera Separated from it. Gardeners' Chronicle, 1922. We are glad to see an appreciative notice and a portrait of Mr Brown in the same paper for April 1922. Attention is properly drawn to the ready help and kindly manners of the distinguished botanist.

Brunker, J. P. Plants of Co. Dublin, in Irish Nat. xxxi., 94, 95, 1922.

Caballero, A. Nuevos datos respecto de la accion de las Chara en las larvas de los mosquitos, in Bot. R. Soc. Espan. Hist. Nat. 61-64, 1922.

Camus, E. C., and A. Iconographie des Orchidees d 'Europe et du Bassin Mediterraneen. Folio atlas, tt. 120, with explanatory handbook. Plain, 100 fr.; coloured, 500 fr. P. Lechavalier, Paris, 1921.

Carr, J. W. *Claytonia perfoliata* in Nottinghamshire, in Naturalist 200-201, 1922.

Chamberlain, Charles J. The Big Tree of Tule, in Chicago School Science and Mathematics 21, 715, 1921. The species is *Taxodium mucronatum*, closely related to, if not a variety of, *T. distichum*. It stands in the churchyard of Tule, about 250 miles south-east of the City of Mexico. Twenty-eight people, with outstretched arms and with finger tips touching, can just reach round the trunk, which is said to be 50 feet in girth, but the measurements do not seem to tally. Its height is 150 feet. As is the case with the largest tree in the world, the Castagna di Cento Cavalli, on Etna—some writers think it is a group of trees, but Prof. Chamberlain examined the *Taxodium* with care and could find no evidence of such a theory. It is beautifully symmetrical and is a giant among its kind. When he visited it in 1908 there was not a dead twig in sight and unlike *deciduum* it is evergreen. This, the Montezuma Cypress, was abundant in the Valley of Mexico when Columbus discovered America. At that time the City of Mexico was an American Venice, with canals for streets, and it was customary for rich Aztecs to have floating artificial islands with little cottages on them, which could be poled round on the neighbouring lakes; but the Spaniards drained the lakes and the big cypress trees disappeared. In the City of Mexico a single historic specimen, the Arbor del Noche triste, under which Cortez rested after his disastrous defeat, still stands protected by an iron fence. *T. mucronatum* is still found as comparatively small trees along the rivers. Prof. Chamberlain thinks the tree cannot be less than 5000 years old. " Some of the Californian Sequoias have reached an age of 4000 years, but the big tree of Tule is at least a thousand years older." It was seen by Humboldt on his journey, and on the east side of it is carved an inscription now partly overgrown. Resting under its shade, says Prof. Chamberlain, " and remembering its great age, one could hardly avoid thinking of events which have occurred during its lifetime. Before the Pyramids of Egypt were built it was a sturdy tree; before Moses led the children of Israel out of the wilderness it must have reached the usual size of the species; when Rome was founded it must have been known as a big tree; in the days of King Arthur and his Table Round, its reputation as a giant among its kind must have been established, and ever since there has been Mexican tradition, Indians have made pious pilgrimages to the Big Tree of Tule. It must have been a familiar object to the prehistoric men who built the Pyramids on the near-by Monte Alban, and who erected the wonderful buildings now known as the ruins of Mitla." This year one of the daily newspapers stated that the great Tree of Tule was beginning to show signs of wear and tear and will wither away before the present generation has passed. The height is given as 175 feet and the spread of its branches as 150 feet.

Under *Castanea sativa* mention will be made of the " Biggest Tree in the World," the Castagna, on Mount Etna, which I visited in 1906.

Chase, Corrie D. Co. Down Plants, in Irish Nat. xxxi., 95, 1922.

CHRISTY, MILLER. The Pollination of the British *Primula*, in Journ. Linn. Soc. xlvi., No. 306, 105, 1922. The insect-visitors of the three British species are enumerated. The whole paper evinces a thoroughness of work and a most judicious reticence in formulating a theory until it has been experimentally proved.

CHURCH, A. H. INTRODUCTION TO PLANT LIFE OF THE OXFORD DISTRICT. Bot. Memoirs, No. 13. Oxf. Univ. Press, pp. 103, 1922; 3/6. A brilliant and most interesting ecological study, full of valuable information and ilustrated with some beautiful photographic pictures of woodland and river vegetation. The chapter on geology is excellent reading. The estimate of the age of the world which satisfied the geologists of thirty years ago is now so much extended that 1000 millions are given without a qualm. The pre-glacial period may be estimated at a million of years ago. The Tertiary period has claimed for it 50-100 millions of years, but there are Families in the Cretaceous period, and the primary lines of divergence between Angiosperms and Gymnosperms may be of Paleozoic antiquity, 300-400 millions. Forest timber trees were in existence in the Upper Devonian, " and this indicates the immensity of the gap still required to account for the rise of a timber tree, producing flowers and seeds from the algal prototypes of the transmigration and the positively hundreds of millions of years required to build the organisation of the arboreal habit from its constituent factors." Dr Church has no doubt about his theories. For instance, we are told that (1) every aquatic of the open stream once grew on the bank: (2) every bank-aquatic was once a plant of damp woodland undergrowth; (3) every plant of swamp-woodland was once in normal woodland as a herbaceous perennial: (4) every herbaceous perennial was once an underwood shrub: (5) every underwood shrub was once a tree of high-forest."

CLARK, J. EDMUND. Flowering Dates of Trees along Main British Railway Routes, in Nature 210, 1922. An important phenological paper. Members willing to afford assistance in these observations are requested to communicate with Dr J. Clark, Asgarth, Purley.

CLEMENTS, F. A. Aeration and Air Content. The Role of Oxygen in Root Activity. Carnegie Institute of Washington Publications, No. 315, 1921; 2 dollars.

Cockerell, T. D. A., and Young, Dorothy. Mutation in *Aquilegia caerulea*—mutat. trifida, near the Smuggler Mine Wood, Colorado. See Nature 701, 1922.

Coltman-Rogers, C. Conifers and their Characters. Demy 8vo. The Macmillan Co., New York; Murray, London, 1921; 21/-.

Compton, R. H. A Systematic Account of the Plants collected in New Caledonia and the Isle of Pines in 1914, in Journ. Linn. Soc., xlv., No. 304, 421, 1922. The Conifers number 31—an exceptionally large number for so small an area, three species being added by Prof. Compton to those previously recorded. *Podocarpus ferruginoides* is a new species. Two new genera are also described—*Austrotaxus*, with the species *A. spicata* and *Callitropsis*, with its species *araucarioides* Compton. He also collected 149 species of Ferns and 26 species of Vascular Cryptogams. *Cyathea neocaledonica*, *Lindsaya neocaledonica*, *Asplenium polyphyleticum*, *Eleophoglossum neocaledonicum*, *Gleichenia Montaguei*, *Lycopodium ignumbiense* are newly described species.

Craib, W. G. Contributions to the Flora of Siam, in Kew Bull. 225, 1922. Contains a large number of new species.

Curtis's Botanical Magazine. Founded in 1787. Edited by O. Stapf, Ph.D. Vol. cxlviii., 48 coloured plates. Annual Subscription, £3 3s. H. F. & G. Witherby, 326 High Holborn, London, W.C., from whom vols. 71 to 147 are obtainable. It is good news to see that this valuable magazine is once again appearing.

Dahlgren, K. V. Ossian. Om *Lysimachia Nummularia* i Sverige. Bot. Notiser, hft. 3, 129-137, 1922.

Dallman, A. A., F.C.S. The First Liverpool Flora and its Author in the Lancashire and Cheshire Naturalist, vol. xiv., p. 244, 1922. This alludes to T. Hall, the author of A Flora of Liverpool, published in 1839. In the preceding year Hall was elected a member of our forerunner, the Botanical Society of London, of which he became local secretary. His address is there given as of Coggeshall, Essex. This paper is an excellent treatment of the subject and a valuable contribution to botanical bibliography.

Darwin, Francis, and Shrubs, A. Records of Autumnal or Second Flowering of Plants, in New Phytologist xxi., 78, 1922.

Davy, J. Burtt. Revision of the South African Species of *Dianthus*. Seventeen species and three varieties are described in a useful clavis. Six new species described by the author are included in that number. One, *D. mooiensis*, was described by Mr F. N. Williams. See Journ. Linn. Soc., June 1922.

Dent, Mrs R. W. The Wild Flower Magazine for 1922, edited by Mrs Dent, is a pleasing publication of an extremely popular Society which acts as a feeder to more advanced work. The February-March number contains a picture of the charming silver rose-bowl which was presented by the members to Mrs R. W. Dent, O.B.E., on the occasion of the 25th anniversary of the Magaine. The report of the work for 1921 shows how industrious the members are. That for the Juniors, under our member, Miss Honor M. M. Pennycoste. includes some distinct rarities. One, however, it is to be feared, is a misnomer—*Tordylium maximum* from Suffolk. Dr Claye's branch C. Juniors are quite good, one of the competitors finding 467 species. The branches presided over by Miss Saunders and Miss Hall have also done well. In this competition 730 plants were found by Miss Richards. Miss Gertrude Bacon gives as a chapter " A Word in Season," which might be read with advantage by many botanists. Miss Robinson, of Sussex, says both her parents remember the appearance of *Veronica Buxbaumii* in England. In the April number Mrs Dent gives an account of a Channel Island visit. Miss Richards, one of our members, reports on Branch A and Mr F. H. Green on Branch J, in which Miss Carmichael has a wonderful collection but, I am afraid, it has misnomers. I should like to see *Carex alpina* and *Pinguicula alpina* (the latter, if correct, would be a most important discovery as the Black Isle, alas, knows it no more). Miss H. H. M. Pennycoste gives an account of the Botany of Par, and the Rev. S. Laing a paper on British Orchids. The June number contains an editorial written from Oxford by Mrs Dent. Miss Hilda Salmon reports on Branch I., Seniors, in which it states our member, Mr R. H. Williamson, found 848 species in the year. The Hon. Mrs Campbell saw *Ononis reclinata* in Devon and Miss Lyon *Asplenium viride* in Sussex. In the August number there is a capital report on Branch Q by Mrs Sandwith, which contains excellent advice. Miss Mason records *Urtica pilulifera* from Norfolk in a new locality. One would much like to see a specimen. Mrs Eyre records *Epilobium alpinum* from Merioneth but it cannot be accepted until a specimen is produced. Miss Thompson's record of *Potentilla fruticosa* from Scotland must await further information. The October number gives notes on the Cumberland Flora by Mrs Dent. *Phleum alpinum*, sent by Miss Scott from Bucks, must be a misnomer. Miss Hillard reports on Branch R. Mr J. Parkin has a paper on the " Lesser Celandine Counts." From the members he received 5224 counts. The general results show that at the height of the flowering season 70 to 80 per cent. of the flowers have eight petals and 98 per cent. three sepals and that the next most frequent number for the petals is nine.

Dixon, Prof. H. H. Practical Plant Biology. A Course of Elementary Lectures on the General Morphology and Physiology of Plants, pp. xi., 291. Longmans, Green & Co., London, 1922; 6/-.

Emerson, F. W. Subterranean organs of Bog Plants, in Bot. Gaz. 359-374, 1921.

Fairchild, David. Inventory of Seeds and Plants imported [into the U.S.] from December 31, 1916, to December 31, 1919 (Nos. 43,391-49,123), and September 21, 1921, to July 1922. U.S.A. Dept. of Agric., Washington. In this wonderful output nearly 5000 separate introductions are tersely noted, chiefly consisting of seeds and plants of economic or horticultural value. Not only are these Inventories most useful when issued but they afford a trustworthy historical record of the date of introduction of plants, some of which may be of the greatest value. The introduction to each number forms an excellent précis. In one (No. 59) it states that *Chenopodium album* is used by many people in the States and is said to be more delicate than Spinach. So *Amaranthus paniculatus* (No. 56) yields a seed which was cultivated by the Aztecs before the discovery of America. Montezuma had 167,000 bushels of its seeds in his granaries. In No. 58 Mr Fairchild says " as the years have passed . . . the proportion of new plants which appears interesting seems to have increased. . . . This is quite the opposite of the prediction of my friends who raised the question in the beginning as to what I proposed to do when all the plants which were worth while had been introduced. Instead of the widening prospect that actually lies before us and which embarrasses with its wealth of opportunity, they saw in their imagination the stream of new plants becoming a tiny brook and finally stopping altogether. It is interesting to note that, whereas in the spring quarter of 1913 there were 407 introductions, six years later, 1919, there were practically as many, 397, and this in the face of the world war, which had demoralised shipping. The dearth is not in plant material of great potential possibilities, but in experimenters who can adapt these plants to the wide uses of mankind. Ten thousand independent experimenters scattered over this country could spend their lives working on the material we have brought in and not exhaust its possibilities." Again in No. 59 he says, " The agriculture of America in the next century will diverge widely from what it is to-day, just as to-day it is something vastly different from its conditions when the Indians hunted over the country. Even now it will be found that the Date oases of California and Arizona, the Durum-wheat areas of the Great Plains region, the feterita-sorghum areas, and the Sudan grass-fields of the West, the Dasheen patches of the South, the Zante-currant vineyards of California, the Timber-bamboo groves of Louisiana, the Rice-fields of California and Texas, if their history is traced, had their beginnings in part or wholly in these inventories." The remark about the falsification of prediction as to the drying up of the stream of introductions has its parallel in Britain where many people in the seventies thought the botany of Britain had been completely exhausted. Yet in the 50 years which have elapsed probably more species have been added to the flora than in any other similar period. And the paragraphs also bear upon the criticism which has been made as to the uselessness of making notes of the occurrences of alien species in Britain. Information is surely needed as to when these adventives came in. The mass, it is true, are ephemeral, but a few have come to stay, and one cannot predict which they may be. Nor can a sharp line of separation be drawn. Some of the more intensive critics would apparently reject rubbish-heap casuals, but would admit escapes from flower-beds in a cemetery! Others would omit reference to *Sisymbrium orientale* but notice *Salix babylonica* or the Larch.

Fawcett, William. Note on William Wright, a Jamaican Botanist, in Journ. Bot. 330, 1922.

Fernald, M. L. The North-American Representatives of *Scirpus caespitosus*, in Rhodora xxii., 25, 1921. Two varieties, *callosus* Bigelow, and nov. var. *delicatulus* are given. The generic name, *Phragmites*, *l.c.*, xxiv., 55, 1922.

Fernald, M. L., and Weatherby, C. A. *Equisetum fluviatile* or *limosum?*, in Rhodora xxiii., 43, 1921. The authors claim the name *limosum* for the type as we do in Britain. In America, as in Britain, there is no strict limitation of the species and variety.

Fries, S. C. E. Die Skandinavischen Formen der *Euphrasia salisburgensis*, in Arkiv. för Botanik, xvii. No. 6, 1922.

Fritsch, K. Exkursions flora fur Osterreich. pp. lxxx., 824. Wien, C. Gerold, 1922. Est *Cardamine bulbifera* als Abkömmling Eines Bastardes Aufzufassen. Berichte der Deutsch. Bot. Ges. 193, 1922.

Fuchs, Alfred. *Orchis Traunsteineri* Saut., in Ber. Naturw. Vereines Schwaben and Neuberg, xlii., pp. 3, 174, t. 47, 1919. *O. pseudo-Traunsteineri* is described as new with several new subspecies.

Fyson, Prof. P. F. The Flora of the Nilgiri and Pulney Hill-Tops. Vol. 3, pp. xviii., 581. Madras Government Press, 1920; 15 r. 6 a.

Gamble, J. S., M.A., C.I.E., F.R.S. A Manual of Indian Timbers. An Account of the Growth, Distribution, and Uses of the Trees and Shrubs of India and Ceylon with Descriptions of their Wood-structures. Reprint of Second Edition with Corrections and Additions, pp. xxiii., 868, including a map, 16 plates of sections of Indian Timbers, and four full page illustrations, *i.e.* Forest of Long-leaved Pine, A Sál Forest in the Dehra Dún, Young Teak Trees, and Clump of Thorny Bamboo. Sampson, Low, Marston & Co., London, 1922; three guineas. Although the subject-matter of this very important work lies outside the sphere of British botany, one is unable to refrain from directing the attention of our readers to it. The investigations of Mr Gamble into the floristic botany of India have been of a very high order of merit, and science is the debtor to him for the results of his manifold labours in, among others, the excellent *Flora of the Presidency of Madras* (see *Rep. B.E.C.* 336, 1921). In this more technical work he has laid the Indian Government itself under great obligations for bringing into such a compact and attractive form an enormous mass of information of the highest economic value. Let us take an example. " One of the most magnificent trees in the world is splendidly figured by Fitch in Hooker and Cathcart's *Illustrations of Himalayan Plants* [of which Dr Thompson's copy, through the kindness of his niece, is in the possession of the writer]. It has large flowers of a glorious rose-red colour, and attains a height of 150 feet. A specimen in full blossom is, as Hooker told me, an astounding sight. The tree is *Magnolia Campbellii* Hook. f. & Thompson Fl. Brit. Ind. i., 41; Hook. f. Ill. Him. Pl., tt. 4 and 5; Gamble Darj. List 2; King Ann. Calc. iii., 208. Red Magnolia. Vernacular Lal Champ *Nep.*; Sigumgrip, sagok, penre, *Lepcha*; Pendder, patagari, *Bhutaia*." Then follows the description. The tree is found in " Sikkim and Bhutan Himalaya at 8-10,000 feet. It used to be very common, and King says that specimens 150 feet high were common in the time of Sir Joseph Hooker's visit in 1849, but the demand for building and tea-box woods has made large trees scarce. . . . The wood is used for planking chiefly. Growth moderate, 11½ rings per inch of radius E. 365. Rangirum Forest, Darjeeling, 7500 ft. (Johnston). 25 lbs.." The last figures refer to the weight of a cubic foot of the wood. In the case of a tree of considerable economic value full particulars are given of its qualities, of its insect pests, and the methods of cultivation. For instance, under the Sandal Wood, *Santalum album*, there are two closely printed pages devoted to it. It yields a heavy timber, as much as 60 pounds in a cubic foot. A large quantity is exported to China for coffins. It affords a valuable essential oil which is best obtained from trees growing at 2-3000 feet altitude. The arrangement follows that of Hooker's *Flora of British India*, and under each family is given the timber-yielding species. There are excellent indices—(1) of European; (2) of Scientific; (3)

of Vernacular names; and (4) of Numbers of Wood Specimens, the latter alone occupying eight pages. There is a good map from Afghanistan and Kukunor southwards including Ceylon and the Nikobar Islands. The work is indispensable to Schools of Forestry and is a most useful book of reference to any who are interested in Indian Botany or Arboriculture. This is shown by the demand which has arisen for this reprint. The introduction is a masterpiece of compression, and the details of the microscopic sections in the plates are well brought out. It may be added that even in 1902 the number of woody plants in India totalled 5000—a third of its then known flora. In this work about 1500 have their wood described, but this includes some exotic trees.

Geisenheyner, L. Zwei Rassen von *Dianthus caesius* Sm., in Verhandl. des Bot. Ver. der Prov. Brandenburg, 34-37, 1920-21 [1922].

Gilbert-Carter, Humphrey. Guide to the University Botanic Garden of Cambridge. pp. xvi., 117, with 23 illustrations. Cambridge University Press, 1922; 3/6. In this pleasing and compact volume, a considerable amount of useful botanical information is supplied about the plants cultivated in the Garden, which through the liberality of Dr Walker, the Vice-Master of Trinity College, was founded in 1762. The Garden of about six acres, by an Act of Parliament, was allowed to be moved to the present site in 1831. The very fine specimen of *Sophora japonica*, near the Pathological Laboratory, marks the original site. The old gateway has been removed and a good illustration shows it at the main entrance of the present Gardens, which, as visitors know, are well arranged and kept in a manner worthy of the University. Under the excellent management of Mr Lynch they held a very varied and rich collection, which it was always a pleasure to visit, and one is glad to see under the altered arrangements that the high standard is likely to be maintained. Following the unfortunate (as some of us think) method of the *Cambridge Flora* all the trivials are spelled with a small letter, and the arrangement of the species is that of Engler. In the introduction it states that " the Law of Priority rules the question of Botanical Nomenclature and that the Law of Aptness holds no sway . . . in practice it is the only legislation possible."

However, under *Welwitschia*, the older generic name *Tumboa* is only quoted in synonymy while the oldest trivial *Bainesii* (inapt as it may be) is cited only, *Tumboa bainesii*, but it has been joined to *Welwitchia* as *W. Bainesii* by Carr. A specimen grown from a seed collected by the late Professor Pearson is in one of the houses. A great many valuable economic notes are tersely added, and a novel feature is the citation of many Indian names which are written in Urdu characters. A useful plan of the Gardens is added, and no visitor to the Gardens should go unprovided with this very useful help.

Godfery, Colonel M. J. The Fertilisation of *Cephalanthera*, in Journ. Linn. Soc. xlv., n. 304, p. 511, 1922. The writer holds, in contradiction to Darwin, that *Cephalanthera* is a very ancient genus and that it is not a degraded *Epipactis*. It shows the earliest method of cross-pollination in the family before a rostellum had yet been evolved. He holds that the genus was well established before *Helleborine* (or, as he calls it, *Epipactis*) came into being. Darwin operated with *C. Damasonium* (*grandifolia*). Had he examined, says Colonel Godfery, *C. rubra* or *longifolia* (which he calls *ensifolia*) he would have assuredly discovered their simple method of cross-pollination and that they are dependent upon insect visitors. He holds that the self-fertilisation of *C. Damasonium* has been developed owing to the scarcity of insects in the shady woods where it grows but that it is an addition to not a replacement of cross-pollination. Notes on Fertilisation of Orchids, in Journ. Bot. 359, 1922.

Griffiths, B. Millard. The Heleoplankton of Three Berkshire Pools, in Journ. Linn. Soc. xlv., n. 305, 1922. These pools are at Bulmershe and White Knights.

Groves, James. On Charophyta collected by Mr T. Bates Blow in Ceylon, in Journ. Linn. Soc. 97. 1922. Our old member, Mr Blow, has collected in many parts of the world and a paper on the Charas collected by him in the West Indies has already appeared (*Journ. Bot.* 323, 1898). Mr Blow's specimens are always well prepared and this gathering is the most extensive yet made for the 'spicy isle of Cinghali.' thirteen species being enumerated in the present article. One is a new species, *Nitella leptodactyla* Groves, of which a figure is given. It is not unlike our own *gracilis*. It was obtained from Moratuwa between Colombo and Galle. *Nitella mucosa* is now made a species. Nordstedt treated it as a form of *pseudo-flabellata*.

GUIGNARD, L. LE JARDIN BOTANIQUE DE LA FACULTE DE PHARMACIE DE PARIS. pp. 180. Marqueste, Toulouse, 1922; 8 frs.

GUNTHER, R. T., M.A. EARLY BRITISH BOTANISTS AND THEIR GARDENS. pp. viii., 417. Clarendon Press, Oxford, 1922. Based upon unpublished writings of Goodyer, Tradescant, and others. An account of Goodyer, his work at British Botany, and a list of his books which he left to Magdalen College Library are in *Rep. B.E.C.* 523-50, 1915, of which it formed a supplement. No copy for review has been received.

GUSTAFSSON, C. E. Nogra ord om Rubusformernas systematik, in Bot. Notiser, heft 4, 190-196, 1922. *Rubus Scheutzii* Lindeb. och *Rubus thyrsanthus* F., in Bot. Notiser, heft 3, 155-158, 1922.

GUERSTLAUER, L. Kritische Potentillen im südwestlichen Bayern, in Bericht. der Bay. Bot. Gesell. xvii., 1-17, 1922.

GWYNNE-VAUGHAN, Dame HELEN. FUNGI. Ascomycetes, Ustilaginales, Uredinales. 8vo., pp. xii., 232, 196 text-figures. Cambridge University Press, 1922; 35/-.

HAAS, PAUL, D.Sc., and HILL, T. G., A.R.C.S. AN INTRODUCTION TO THE CHEMISTRY OF PLANT PRODUCTS. Vol. II. Metabolic Processes. With diagrams, pp. 140. Longmans, Green & Co., London, 1922; 7/6. The first volume dealt with the nature and significance of the commoner organic compounds of plants; in this volume, dealing with Metabolism, the authors give an outline which forms a basis for the study of the processes. The authors instead of giving as full an account as possible of the literature have chosen the more difficult task. The work is arranged under the heads of the Living Plant, the Hydrogen Ion Concentration, the Synthesis of Fats, Carbohydrates, Proteins, Respiration and Growth. The book is necessarily highly technical and is outside the sphere of study by field botanists, but to the physiological student, from the high reputation of its authors, it must strongly appeal, and will prove of great service. The much discussed vitamins of which three are at present recognised are—A, fat soluble; B, water soluble; and C, which may or may not be identical with one of the other two. A is the growth promoting or anti-rachitic, B the anti-neuritic or anti-beri-beri vitamin, and C, for convenience, is termed the anti-scorbutic vitamin. They appear to be produced only in the vegetable world—no animal is able independently to produce vitamins for its own use. A is associated with fats or oils especially in fish-livers, *i.e.*, cod liver oil, but the vitamin is said to be obtained from the Algae and other plants devoured by fish. Vegetable oils strangely contain a low content of vitamin A. Vitamin B is associated with the pericarp of rice and other grain hence the importance of not carrying the milling process of cereals too far. Vitamin C is associated especially with growing plants and is not contained in the seed as such, but the germinating seed is an effective anti-scorbutic. The knowledge of the subject is, however, embryonic and it is not at all certain whether either of the two hypotheses as to their constitution is correct, *i.e.*, Williams says they are related to hydroxypyridine and contain a betaine ring, while Bessanoff affirms they are polyphenolic substances related to hydroquinone—either sufficiently alarming in name to a nervous invalid who has to swallow them.

HAMPDEN, MARY. BULB GARDENING, 7/6; ROSE GARDENING, 7/6; TOWN GARDENING, 6/-. Thornton, Butterworth, Ltd., 1921.

HEDEREN, BIRGEN. *Anemone Hepatica* L. in Transtrand, Dalarne, in Svensk Bot. Tids., xvi., 302. 1922.

HEGI, G. Illustrierte Flora von Mittel-Europe. Lehmann, München, 1922.

HENRIKSSON, J. *Anemone nemorosa* L., var. *marginata*, nov. var., in Bot. Notiser, heft 2, pp. 103-104. 1922.

HILEY, W. E., B.Sc. OXFORD FORESTRY MEMOIRS. An investigation into the height and growth of trees and meteorological conditions. Clarendon Press, Oxford.

HITCHCOCK, A. S. The Type Concept in Botany, in American Journ. Bot. vii., 251, 1921.

HOFFMANN, R. Flora of Berkshire Co., Mass., in Proc. of the Boston Soc. of Natural History 171-382, 1921.

HOOKER, Sir J. D. 201 letters to Sir W. T. Thistleton-Dyer, 1870-1909, who has kindly presented them to the Library at Kew Gardens. Lady Hooker has also presented 37 original notebooks of his Indian and other travels as well as other material. W. B. Hemsley has also presented his letters from Sir J. D. Hooker.

HOLM. T. CONTRIBUTIONS TO THE MORPHOLOGY, SYNONYMY, AND GEOGRAPHICAL DISTRIBUTION OF ARCTIC PLANTS. Rep. of the Canadian Arctic Exped., 1913-8. Vol. 5, Botany, pp. 139. F. A. Acland, Ottawa.

HOWARTH, O. J. R. The British Association for the Advancement of Science: A Retrospect, 1841-1921, pp. vii., 318. Brit. Ass., Burlington House, London, 1922; 7/6. The Association was founded by Sir David Brewster in 1831. Its first meeting was held at York, the second at Oxford, the third at Cambridge. The Association has expended in grants since 1834 about £83,000, of which the Botany, section K., has received the modest amount of £1952.

HUGHES, Miss D. K. Further notes on the Australian Species of *Stipa*, in Kew Bull. 15, 1922. The Australian species now number 42 and six are at present dubious. Two new ones *bigeniculata* and *effusa* are included in this paper. Serrato-ciliata group of *Tropæolum*, in Kew Bull. 63, 1922, with key to species.

HURST, CECIL P. East Wiltshire Lichens, in The Wiltshire Magazine, vol. 42, pp. 1-16. This gives a list of 85 lichens observed during the last three years, the most important of which is *Bilimbia Naegelii*.

IKENO, S. On Hybridization of some Species of *Salix*, in Ann. of Bot. 175-191, 1922.

JEDIN, OLOF. Zur Blüten und Befruchtungsbiologie der Leindotter (*Camelina sativa*), in Bot. Notiser, heft. 4, 177-189, 1922.

JOHANSSON, W. K. Ulmus-studier pa Oland, in Bot. Notiser, heft 4, 197-202. 1922.

JOHNSTON, Col. H. H. ADDITIONS TO THE FLORA OF ORKNEY, as recorded in Watson's "Topographical Botany," second edition (1883), in Trans. Bot. Soc. Edin., vol., xxviii., pt. 2, p. 52, published December 21. This does not mean that they are additions to the known flora, but only additions to Top. Bot., since many have been already recorded, some in our own pages.

KEMPTON, J. H. Inheritance of Ramose Inflorescence in Maize, with photographs, in U.S.A. Bull., 971, Dept. of Agric.

KLOOS, A. W. Aanwinsten van de Nederlandsche Flora in 1920, in Ned. Kruid K. Arch. Jaerg. 1921, gives many adventives from Holland, including a new *Oenothera*, *i.e.*, *argentinae* Lév. et Thell., allied to *O. laciniata* Hill

KNOCHE, H. FLORA BALEARICA: Etude Phytogeographique sur les Iles Baleares, 534, 1921.

KNUDSON, L. Nonsymbiotic Germination of Orchid Seeds, in Bot. Gaz., 1-25, 1922.

LACAITA, C. Addenda et emendanda ad Floram Italicam, in Bull. Bot. Soc. Ital., 18, 1921.

LANG, Prof. W. H. TRANSLATION OF STRASBURGER'S TEXT-BOOK OF BOTANY. Fifth English Edition, pp. xi., 799. Macmillan & Co., London, 1921; 31/6.

LANKESTER, C. H. A Short Trip on Mt. Elgon, Uganda, in Kew Bull. 145, 1922.

LARTER, Miss C. E. Thirteenth Report of the Botany Committee, in Trans. Devon. Assoc. 89-97, 1921.

LAW, ERNEST C. B. SHAKESPEARE'S GARDEN, pp. 34, tt. 21, Selwyn & Blount, London, 1922. The beautiful illustrations in the book will appeal to those who become its possessor. The author pleasantly shows how the improvements at Stratford have come about and how beautiful the Knott Garden and the Long Border have been made by those who took up the work as a labour of love. Shakespeare lovers in many parts of Britain have contributed to this happy result. Among others, Marie Corelli gave fifty pounds when the funds were low. The idea is a charming one. May it be copied in many places where at present a town space is hideous for want of a little care and forethought. There are many references to Shakespeare's flowers in this little volume. The author need not have run such a tilt against Latin names, uncouth as they are, since grosser names have been given them in English literature as Shakespeare well knew, and even the Long Purples of Warwickshire might have an entirely different meaning in another part of England. Nor is an English name like Marigold always pronounced in one way any more than *Reseda*.

LEDENGREN, G. R. Anteckningar till Sveriges Adventis-flora, II.

LEROUX, E. OSIERCULTURE. pp. 352. J. B. Baillière et Fils, Paris; 10 francs.

LITTLE, J. E. Notes on North Herts Willows, in Journ. Bot. 79, 1922.

MATHIESEN, FR. J. SCROPHULARIACEAE. The Structure and Biology of Arctic Flowering Plants. Meddel om Gronland 361-507, tt. 46, 1921.

MATTHEWS, J. L., M.A. The Distribution of Plants in Perthshire in Relation to Age and Area, in Ann. Bot. xxiv., 321, 1922. The principle worked out by Willis from the study of numerous floras "that *on the average* the older a species is within a given country the greater area it will occupy" is one which is now generally accepted. The effects of man's occupation are one of the modifying factors emphasised by Willis. The writer has compared the flora of Perthshire on these lines and finds it agrees perfectly with the general aspects of the theory advanced in "Age and Area" — the widely distributed species in Perthshire prove to be common species in Britain. In both the rarity is 2-2, and 502 species out of a total of 738 exhibit a remarkably striking descending series quite comparable with the ' Wides ' of Willis. But Perthshire possesses 103 rare, entirely Lowland, species, as many as 40 of these being limited to a single district. The numbers run in an opposite direction to the ' Wides.' Since these species are not endemics, their great variety cannot be due to recent origin, but on Willis' theory to recent arrival within the county. They are confined very largely to Gowrie and Lowland Earn, where the bulk of the Perthshire flora seems to have entered, and they are thus possibly at an early stage of invasion. It would be necessary to see this long list of species before assent could be given as to their recent arrival. The Highland element is excluded from the application of the same law. Matthews says it has been estimated that 13,000 years have elasped since the emergence of Scotland and Scandinavia from the ice cap of the last glacial period. Since then an Arctic flora has almost entirely disappeared. Numerous species once occurring in Britain are now extinct. Those that remain are confined to our higher hills . . . and must be regarded as relics of an outgoing flora. Are *Oxytropis campestris*, *Carex polygama*, *Carex salina*, and *Deyeuxia* to be taken as ' relics ' or ' arrivals '?

MENDEL, GREGOR. The Centenary of the Abbot Mendel took place on September 22, 23 and 24 of this year at Brunn, in Czecho-Slovakia.

MERRILL, E. D. A BIBLIOGRAPHICAL ENUMERATION OF BORNEAN PLANTS. Journ. Straits Royal Asiatic Society, 637, 1921, London, W. Wesley ; 8 dollars 50 cents. A review of the new species of plants proposed by N. L. Burman in his Flora Indica, in Philipp. Journ. Sc. 329-388, 1921.

MURR, Prof. Dr JOHN. GESCHICHTE DER BOTANISCHEN ERFORSCHUNG LIECHTENSTEINS. pp. 80, 1922.

NATIONAL TRUST. Report for 1921-2 gives particulars of the property recently acquired. It includes 70 additional acres at Box Hill through the generosity of Miss A. B. Warburg. Mr Emery Walker has presented some land near Eashing Bridge. An extra portion of land bordering Derwentwater has also been purchased so as materially to improve the beauty of the Memorial to Canon Rawnsley. The picturesque ruin of Lyveden New Build in Northamptonshire has also been obtained.

Nuttall, G. C. Beautiful Flowering Shrubs. pp. 291. Cassell & Co., London; 21/-.

Ostenfeld, C. H., and Paulsen, Ove. [Plants of] Southern Tibet. Discoveries in Former Times compared with my own Researches in 106-8, by Sven Hedin, pp. 27-100, tt. viii. These plants, numbering about 260, were collected in the Pamir, Tibet, and East Turkestan. The new species incude *Chondrilla polydichotoma* Ostf., *Saussurea humilis* Ostf., *Aster Hedinii* Ostf., *Artemisia Hedinii* Ostf., *Pedicularis Svenhedinii* O. Pauls., *Acantholimon Hedinii* Ostf., *Pleurospermum Hedinii* Diels, *Myricaria Hedinii* O. Pauls., *Euphorbia altobetica* O. Pauls., *Astragalus toatjenensis* and *Hedinii* Ulbrich, *Oxytropis thionantha*, and *Hedinii* Ulbrich, *Glycyrrhiza Hediniana* Harms., *Sedum dubium* O. Pauls., *S. stamineum* O. Pauls., *Delphinium candelabrum* Ostf., *Polygonum peregrinatoris* O. Pauls., *Calamagrostis Hedinii* Pilger and *Potamogeton tubulatus* Hagstr. One new genus, *Hedinia* Ostf., allied to *Hutchinsia* and *Capsella*, is established by Dr Ostenfeld.

Pearsall, W. H. The Development of Vegetation in the English Lakes considered in relation to the General Evolution of Glacier Lakes and Rock Basins, in Proc. Roy. Soc., Biol. Sect., ser. B. 259-284, 1921. Plant Distribution and Basic Ratios, in Naturalist 269-271, 1922.

Pearsall, W. H., and Mason, F. A. Yorkshire Naturalists at Thornton Dale, in Naturalist [List of Plants] 289-296, 1922. Yorkshire Naturalists at Filey, in Naturalist [List of Plants] 317-320, 1922.

Petch, T. *Statice Limonium*, on the north bank of the Humber, in Naturalist 9-12, 93-96, 121-124, Addendum 155-156, 1922.

Piper, C. V. Important Cultivated Grasses, U.S.A. Dept. of Agriculture, Farmers' Bulletin, n. 1254, Washington, 1922. This is a most valuable and practical paper. We copy what the writer says about the study of Grasses: "It is not necessary to have any elaborate instruments for examining them or to acquire a detailed knowledge of their structure. Nearly every grass is so distinctive that once a person has noted its obvious characteristics he will easily recognise it again. Though there are probably about 6000 distinct species of grasses in the world only about 60 are important cultivated plants, and not more than 20 wild species are abundant or valuable in any one locality." Some excellent figures of the details of the inflorescence are given.

PIPER, C. V., and DUNN, S. T. Revision of *Canavalia*, in Kew Bull. 129, 1922, with key to the old-world species. Dunn describes three, and Piper two new species.

POLE, EVANS I. B. THE FLOWERING PLANTS OF SOUTH AFRICA. Vol. i., cr. 4to, tt. 40. L. Reeve & Co., 1921; £3 6s.

PORSILD, THORBJORN. Griffelhaarene hos *Dryas octopetala* L., og *Dr. integrifolia* Vahl (the pubescence of the styles in *Dryas octopetala* L. and *D. integrifolia* Vahl), in Bot. Tidsskrift, bd. 37. heft 2, pp. 121-4, 1920.

PRAEGER, R. LLOYD. *Equisetum litorale* Kuehl., in Irish Nat. xxx., 145, 1921.

PRAIN, Sir DAVID. A warmly-worded address. together with some parting gifts, was given to Sir David on his retiral by the staff at Kew. His tenure of the office was a brilliant one and he carries with him into retirement not only the good wishes of his staff but of all those botanists with whom he has been brought into contact.

REA, CARLETON. BRITISH BASIDIOMYCETAE. A Handbook to the Larger British Fungi. Published under the auspices of the British Mycological Society. pp. xii., 799. Cambridge University Press, 1922; 30/-. In this model of conciseness, our member has produced a text-book which must prove invaluable to the study of the larger Fungi. His thirty years' experience in the investigation of this group is of a very thorough nature and has commanded the respect of our leading fungologists. That the Royal Society contributed to its preparation is an evidence of the authoritative standard of the work. A key to the divisions and genera is given. The specific descriptions are clear and concise, and the original authority for the species, when differing from the one adopted, is given, *e.g.*, *Caloceras tuberosa* (Sow.) Fries, with a reference to Sowerby's figure. The derivation of the generic name is supplied, *i.e.*, kalos = beautiful, keras = a horn. A copious bibliography is supplied occupying eight pages. The specific names are arranged in the index alphabetically, the generic name following, *i.e.*, *clavatus* (Batt.) Quél. (*Coprinus.*) Synonyms are printed in italics. This saves much trouble when looking for the species. It may be added that Cook's illustrations are cited throughout. The author must be most warmly congratulated on his completing so important an addition to our British text-books, which will doubtless for many years be the hand-book of every student of this varied and difficult group.

PRATT, A. WILD FLOWERS. 2 vols., cr. 8vo, pp. 196, 231. S.P.C.K., London, 1922; 10/-.

PRIESTLEY, J. H., and HINCHCLIFF, MILDRED. The Physiological Anatomy of the Vascular Plants characteristic of Peat, in Naturalist 263-268, 1922.

PUGSLEY, H. W. Notes on British Euphrasia, in Journ. Bot. 1, 1922. He gives a new form—f. *albida* of *E. confusa.* He doubts if *E. stricta* has been found in Britain.

RAYNER, J. F. The Botany of the Southampton District, in Trans. S. E. Union of Scientific Societies, pp. 43, 1922. This is a useful account of the plants of the area and includes several which are new county records. There are a large number of adventives. One of these, *Crepis mollis*, is, and it is the first time I have seen it, recorded in that grade. *Solanum maritimum* is an addition to the British list. The *Euphorbia Esula*, however, proves to be the commoner *E. virgata*.

RIDLEY, H. N., F.R.S. THE FLORA OF THE MALAY PENINSULA. Vol. I., Polypetalae. pp. xxxv., 918, 1922. L. Reeve & Co., London; £3 3s. *Rigiolepis* and other Vacciniaceae of Borneo. Four new species are described.

ROBINSON, J. FRASER. *Cephalanthera Damasonium* Druce = *C. grandiflora* Gray, *C. pallens* Rich., etc. Near Brough, E. Yorks. See *Naturalist* 22, 1922.

ROBSON, F. OUR WAYSIDE TREES AND HOW TO KNOW THEM. Thornton, Butterworth, 1921; 6/-.

ROCK, JOSEPH F. The Chaulmoogra Tree (*Taraktogenos Kurzii* King) and Some Related Species: A Survey conducted in Siam, Burma, Assam, and Bengal, in United States Dept. of Agric., Bulletin n. 1057, April 1922. The use of Chaulmoogra Oil in leprosy, one may say the successful use, is the justification for this excellent research into the vegetable origin of, and the distribution of the plants yielding, a fatty oil, not a volatile oil. The isolation of Chaulmoogric and Hydnocarpic acids was made by my friend, Dr F. R. Power, in London, and he, with his collaborators, prepared their respective esters. Several photographs of the trees growing in Burma are added. The tree is a slender, smooth-barked species, with pendulous branching habit, about 50 feet in height, with fruits about the size of a large orange of a light fawn colour and velvety tomentose. The collection of the fruit is difficult on account of the number of tigers which infest the jungle. Mr Rock with thirty coolies was followed for a whole day in broad daylight in this district by a tiger which during the following night killed three women and a two-year-old child.

ROHDE, ELEANOR SINCLAIR. THE OLD ENGLISH HERBALS. pp. viii., 243, with coloured frontispiece and 17 illustrations. Longmans, Green & Co., London, 1922; 21/-. This handsome volume deals with that attractive and curiously neglected branch of garden literature, the Old English Herbals from Anglo Saxon times to the end of the seventeenth century. The chapter on early MS. herbals treats of Anglo-Saxon plant-lore and folk-medicine of which these MSS. are the sole source. A chapter is devoted to herbals written in connection with the colonisation of America by the Spaniards and English. This chapter contains information concerning the first records of Red-Indian plant lore, English weeds introduced into America with the first colonists and early lists of plants in New England gardens. For some years our members, Dr and Mrs

Charles Singer, have studied with great detail the MSS. of Anglo-Saxon Herbals and the authoress is indebted to them for reading the proof-sheets on this subject. The earlier MSS. perished, perhaps at the hands of the Danes, but Herbals existed as early as the eighth century since (as is quoted) Boniface, the Apostle of the Saxons, received letters from England asking him for books on simples and complaining that it was difficult to obtain the foreign herbs mentioned in those we already possessed. The earliest which exist, says the authoress, dating from the tenth century, are The Leech Book of Bald, once in Glastonbury Abbey, which in date precedes the books of the Salernian School, the Lachnunga, the Saxon Translations of the Herbarium of Apulius, and the so-called Περὶ Διδαξέων (Peri Didaxeon) which exists as a Saxon translation in the Harleian MSS. in a thin, badly mutilated, volume which shows that it is in part indebted to writers of the Salernian School. As the writer cogently says " the two latter are less interesting because they are translations, but the more one studies the original Saxon writings on herbs and their uses, the more one realises that . . . . there are suggestions and traces of an age far older . . . . and embedded beliefs which carry us back to the dawn of history. It is this which gives this plant-lore its supreme interest."

The oldest herbal known in Britain is the one in the British Museum called " The Leech Book of Bald," evidently the manual of a Saxon doctor, which dates from A.D. 900-950. It was penned on vellum by Cild the scribe and to-day exists in excellent preservation. It consists of 109 leaves of vellum on which, probably shortly after the death of Alfred, is written in a large bold hand the vernacular text which here and there has a faintly illuminated initial letter. It was written, so Mrs Rohde says, under the direction of Bald who, if not a personal friend, had access to King Alfred's correspondence, for one chapter of the Leech Book consists of prescriptions of drugs such as a resident in Syria would recommend. These had been sent by Helias, the Patriarch of Jerusalem, to Alfred, whom we may perhaps claim as an early botanist, since Bishop Asser tells us that he kept a book in which the King entered " little flowers culled on every side from all sorts of masters," unless indeed this referred to flowers of speech. One of the prescriptions sent by the Patriarch was ' the white stone ' which is powerful against flying venom. In these times the priest was the doctor's rival in medicine, the cure of bodies as well as souls being claimed. Mrs Rohde has studied the MS. with great care, and gives a scholarly and literary account of its contents.

The earliest illustrated herbal of Saxon times is a translation of the Latin "Herbarium Apuleii Platonici" (supposed to date from the 5th century), which belongs to the school of Aelfric of Canterbury, circa 1000-1050. It is also in the British Museum. Each of the 132 chapters contains the description of a herb but many of the plant illustrations are copied from an older work, itself probably not the original drawing. Dr Singer once took the writer to see this wonderful work with its coloured frontispiece in which Plato is represented as holding a volume which has been given him by Aesculapius and the Centaur.

"The Lachnunga," or Liber Medicinalis, likewise in the Harleian MSS. of the British Museum, dates from the tenth century. It is a small, thick volume without illustrations. It was acquired by a great investigator of Anglo-Saxon documents, Humfrey Wanley—once an assistant at the Bodleian Library, who received a stipend of £12 a year—towards the end of the seventeenth century from Barbara Crokker, who could not read and doubtless knew nothing of the value of the book. A fascinating account is given of these early MSS. which teem with points of interest. It shows how in those early days a wide knowledge of medicine was possessed, mingled as it was with dense superstition, in a few of its phases bearing resemblance to some of the practices of the present day. It bears evidence to the extensive use of medicines obtained from far distant lands showing that communication with the outer world was more prevalent in those distant times than we are wont to suppose.

The centuries succeeding the Norman Conquest proved a dull time for science and we find no important work on plants for many years, but the various transcriptions of Macer's Herbal, and of the works of Bartholomaeus Anglicanus are fully acknowledged. It may be mentioned that the "Sinonima" of that author was printed at Oxford in 1882. The "Breviarum" is preserved in Pembroke College, Oxford. The "De Proprietatis Rerum," of 19 books, was, says Mrs Rohde, probably written about the middle of the 13th century. Oxford has a copy, dated 1296. It was translated into

English in 1398 by a Cornishman, John de Trevisa, a Fellow of Exeter College, and Chaplain to Lord Berkeley. The " De Herbis," printed in 1495, abounds with delightful pictures of medieval life, and contains probably the first botanical illustration printed in an English book. Its printer, Wynken de Worde, says that Caxton had a hand in its publication which, however, is not accepted by modern bibliographers. We are told by Wynken de Worde that " John Tate the yonger which late hathe in England doo make this paper thynne. That now in our Englysh this boke is printed Inne." The first evidence of English-made paper.

Strictly speaking the first English Herbal is that of Richard Banckes, published in 1525, which went through several editions, two being erroneously attributed to Ascham, the Astrologer. Of the second edition the only known copy is in Cambridge University Library. It was far more interesting than the better known "Grete Herbal," which was printed in England in 1526, a translation of the French " Le Grand Herbier," itself adapted from the " Circa Instans," written by Bartholomaeus in 1458. Its English publisher was Peter Treveris who had a printing office in Southwark. The third chapter is allotted to William Turner, the Father of British Botany, of whose life and works a most excellent account is given. Full justice is also done to Lobel and Dodoens. Another chapter is devoted to John Gerard and his " Herbal " in which discriminating praise is accorded to the great botanist. One is glad to see the tribute to " his matchless Elizabethan English." It may be added that Gerard added eighteen original woodcuts, one of which represents the " Virginian " Potato, to the 1780 which he had borrowed from Nicholas Basseus of Frankfurt, and which had already appeared in the " Eicones " of Tabernaemontanus. It is pleasing to read extracts from Gerard's London plant localities of *Sagittaria* " growing in the Tower Ditch and Vervain Mallow on the ditch-sides on the left hand of the place of execution by London called Tyburn."

A delightful feature of the book is the account of the early herbals relating to the New World, the earliest cited being that of Nicolas Monardes, a Sevillian doctor, written in 1569 when Spain was at its zenith of power. Clusius translated it into Latin. Mrs Rohde gives a fascinating account of these and delectable extracts which one would like to have quoted. Here we get perhaps the earliest use of the name *Tacamahaca* ‘a rosin of a very sweet smell’ taken out of a tree as large as a willow. The name is now misapplied to a Poplar. The second part gives the first account of the ‘hearbe tabaco.’ Sassafras is also mentioned. The native Indians described its medicinal effects to the Spaniards. Accounts are also given of Josselyn’s “New England’s Rarities Discovered,” and of Hughes’ “The American Physitian,” of 1672, and Petiver’s account of Feuillé’s “South Sea Herbal” of 1715. Then follows a chapter of John Parkinson with an excellent account of his two great works the “Paradisus” and “Theatrum.” The later seventeenth century herbalists include Nicolas Culpeper and the Oxfordshire William Coles, the author of “Simpling” and of “Adam in Eden.” Some amusing extracts from still-room books, compiled by distinguished people, are given, but still-rooms are things of the past. The bibliographies, or rather the list of Herbals, MSS. and printed, arranged in chronological order, extend to 46 pages and are of extreme value. The list might be even made more useful by having an index to the authors’ names and by adding the page of the book to such as are mentioned in the text. The book is singularly free from misprints but ‘Hutton, 76, Bodleian’ should be Hatton, 76, Bodley or Bodleian Libr. References might have been made to Earle’s “English Plant Names,” which treats of those used in the Herbals from the tenth to the fifteenth century, to Mowat’s “Alphitá,” a Medico-Botanical Glossary of about 1465, which is substantially that published in Renzi’s “Collectio Salernitana,” to Bentley and Trimen’s “Medicinal Plants,” to Hanbury and Flückiger’s “Pharmacographia,” and Woodville’s “Medical Botany.” But these are trifling matters. The book holds one so that it is difficult to release oneself from its spell. It should be on the shelf of every flower-lover who wishes to know something of the history of the thing he loves.

SALT, HENRY S. THE CALL OF THE WILDFLOWER. pp. 192, 1922. G. Allen & Unwin, London; 6/-. In this breezy book of Mr Salt’s we are carried into pleasant scenery with a charming guide. He loves the flowers and the country which they haunt. Nor are his interests limited to plants and their habitats. The places he conducts us to are pleasant spots—the Sussex Shingles—‘ salt and splendid from the circling brine ’—Shoreham with its introduced *Trifolium stellatum* and its native *Vicia lutea*, or Pagham with its Proliferous Pink. “ By Ditch and Dike ” includes a sketch of those rich hunting-grounds—the Amberley Wild Brooks, the Pevensey levels, or the Lewes meads. Mr Salt has not an unwonted admiration for botanical nomenclature, and he rightly condemns the indiscriminate use of “ Common ” as an English appellative since as he says any one searching for the “ Common hare’s-ear ” would find that he had got his work cut out. He dislikes, too, personal names for genera, such as *Hottonia* or *Hutchinsia*. His reasons, however, are not convincing. He is more contented and more at home on the open downland, where the pride of Sussex, the *Phyteuma orbiculare*, grows, or the early Spider Orchis gladdens the eye, or near the Ditchling Beacon where he can see the Musk Orchid and enjoy the freedom and space which the Downs afford. He makes a sturdy protest against those marauders who take plants away in such quantities as to threaten the very existence of the species. A delightful chapter is devoted to “ A Sandy Common,” with all its varied vegetation, nor are the Derbyshire Dales omitted with their *Silene nutans*, *Hutchinsia* and *Draba muralis*. But why should *Draba* be spelled with a little “ d ” and *Thlaspi* with a little “ t ”? “ Limestone Coasts and Cliffs ” are illustrated by the Orme’s Head and Arnside Knott, but we may say that the *Cotoneaster* he saw at Capel Curig was not the rare Orme plant, which once rejoiced in the inapplicable name *vulgaris* but a Himalayan cousin *C. microphylla*. “ A Northern Moor ” refers to the splendid area round High Force in Teesdale with all its splendid plants, and in “ Snowdonia ” he describes an April visit. A good description is given of its splendid scenery, and of the places of growth of *Lloydia* and *Saxifraga oppositifolia* of which it is said that it is a true Alpine not found in this country much below 2000 feet. In Sutherlandshire the writer has seen it at less than 200 feet in great beauty. On Helvellyn he describes the *Cerastium alpinum* and the rich growth of the alpine lady’s mantles with which the Lake District abounds. Needless to say the book is written with a literary charm which will delight a large circle of readers.

Russell, T. H. Mosses and Liverworts. An Introduction to their Study, with Hints as to their Collection and Preservation. pp. 200. Sampson, Low, Marston & Co., London, 1908. This work, written by a friend of our old member, J. Bagnall, has recently been brought to my notice. It may be of service to those who are beginning the study of these groups since it abounds with practical information.

Salmon, C. E. *Statice anfracta*, a Dalmatian species, described in Journ. Bot. 345, 1922.

Sanders, T. W. List of Hybrid Orchids, containing all the known Orchids of hybrid origin with their parentage and synonyms. With addenda up to September 1921. London, 1921.

Sargent, C. Sprague. Manual of Trees of North America. Edition 2, pp. 900, 783 figures. Constable & Co., London, 1922; 46/-. It includes descriptions of 717 species belonging to 85 genera.

Schlich, Sir William. Manual of Forestry. Vol. I. Forest Policy of the British Empire. Fourth edition, revised and enlarged. pp. xi., 342. Bradbury, Agnew & Co., London, 1922. In this, the fourth edition of a very important work, Sir William Schlich has endeavoured to give an account of the condition of forest conservancy in the Empire as it stood in July 1920. He gives figures showing the immense importance of Forest Maintenance since nearly £70,000,000 of products were imported into Britain in 1913. The great bulk was unmanufactured timber, amounting to nearly half the whole, *i.e.*, £33,789,000. Manufactured timber and wood-pulp came to over £8,000,000. The next most valuable product is caoutchouc to the value of £14,000,000. Sir William pleads for active assistance in providing woodlands in the vicinity of great towns in England, not only for the æsthetic and ethic effects of forest life and scenery, but because their produce will find a ready sale at good prices. Their establishment under rational treatment need not be a financial burden. Forests, as he says, offer a convenient opportunity for the investment of capital and the profitable utilisation of inferior land. They produce a demand for labour in the management and working; they reduce evaporation and increase the relative humidity of the air. These are only a few of the advantages he claims. Britain, as compared with Continental countries, has a small amount of land under forest, and during the war this was greatly diminished, so that our woodland is well-nigh negligible. Only 0.07 of area per head of population is possessed by us as compared with .62 in Germany and France and 9.4 in Sweden. Taking our Empire as a whole Sir William estimates its population at 447,000,000 and its area at 14,000,000 square miles, the population numbering 378 to a square mile in Europe, 3 in Canada and 2 in Australia. Our net imports of timber amount to 217,730,000 cubic feet.

A very interesting chapter is devoted to the Forests of Britain and their produce. Extremely valuable statistics are supplied as to the sources of imported timber. Forestry in India is treated in a masterly way : indeed there is no higher authority on the subject. Canada and Australia are both adequately noticed and due attention is paid to Ceylon, our African possessions and to the West Indies. It is an indispensable volume to every School of Forestry and British landlords may find in it a source of profit as well as pleasure.

SCHARFF, R. F. Thirty Years' Work of the Irish Naturalist, in Irish Nat. xxxi., 1-7, 1922.

SCHÖNLAND, Prof. S. INTRODUCTION TO SOUTH AFRICAN CYPERACEAE. 8vo, pp. 72, tt. 80. Bot. Survey of South Africa, memoir n. 3, Dept. of Agric. Pretoria, 1922 ; 10/6.

SEWARD, A. C., F.R.S. The Hooker Lecture—A Study in Contrasts. The Present and Past Distribution of Certain Ferns. Journ. Linn. Soc. xlix., 219, 1922. A SUMMER IN GREENLAND. pp. lxiv., 100. Cambridge University Press, 1922 ; 7/-.

SHEPPARD, T., M.Sc., F.G.S. HANDBOOK TO HULL AND EAST RIDING OF YORKSHIRE. Prepared for the Members of the British Association . . . on the occasion of their visit to Hull 1922. pp. vi., 532. A. Brown & Sons, London, 1922. This compact, yet handsome volume, does infinite credit to the Hull Committee and to the Editor and Contributors of the various chapters who have so successfully dealt with a difficult task. The chapters include the

Evolution and Past History of Hull; its Antiquity, and the Rise and Progress of the Port, the latter by Sir A. K. Rollit, K.B., who died before the work appeared. With regard to the health of the town it may be said that while the death-rate in 1874 was 23.8. in 1921 it was only 13 per thousand. Hull Coins and Tokens are described by W. Sykes, and many of them are figured. An interesting chapter is devoted to Old Farming Methods in East Yorkshire, and Mr Strachan describes its agriculture. Prehistoric Remains and the Romans and Anglo-Saxons in the East Riding are by the Editor. Mr John Nicholson writes on the Place-Names of the area. The changes in the surface are evidenced by the chapter on the Lost Towns of the Humber. The zoological side is well treated. Dr Irving contributes an article on the Marine Mollusca, and Mr J. W. Taylor an important paper on Land and Freshwater Mollusca. The Crustacea, Coleoptera, Lepidoptera, Diptera, Hymenoptera, Arachnida and Plant Galls are also described. The Botany of East Yorkshire is from the pen of Mr J. Fraser Robinson. The Non-Vascular Cryptogams are not overlooked. Naturally it is the Botany in which we are most interested, and Mr Robinson has done his work in a very capable manner. It may be well to give the census of species which Mr Robertson supplies. I have added the numbers which occur in Berks for comparison, but it must be remembered that the standard of species is not the same in both counties.

Type.	Britain.	E. Riding.	Berks.
British.	532	532	931
English.	409	291	
Germanic.	227	28	78
Atlantic.	70	4	10
Highland.	120	—	3
Scottish.	81	20	19
Intermediate.	37	10	9
Local.	49	3	8
Total.	1525	888	1058
Alien. Casual.	—	143	324
Incognita.	—	19	12
	1525	1050	1394

The members of the British Association were fortunate in having such a useful volume supplied to them.

Shull, G. H. Three New Mutations in *Oenothera Lamarckiana*, in Journ. Hered. 354-363, 1921.

Skipper, E. G. The Ecology of the Gorse (*Ulex*) with special reference to the growth-forms on Hindhead Common, in Journ. of Ecology x., 24-52, 1922.

Sprague, T. A. The Seedling Foliage of *Ulex Gallii*, in Journ. Bot. 6, 1922. The Nomenclature of Plant-Families, *l.c.*, 69, 1922. The Type Species of *Bignonia*, *l.c.*, 236, 1922. Revision of *Amoreuxia*, in Kew Bull. 97, 1902, with key to the species, three of which are new.

Stebbing, E. P. The Forests of India. Two. vols., 8vo, pp. xv., 548. J. Lane, London, 1922; 42/-.

Stelfox, A. W. *Prunus Padus* in Wicklow and Kilkenny, in Irish Nat. xxx., 145, 1921. *Carex axillaris* in Co. Dublin, *l.c.*, xxx., 145-146, 1922. *Poa compressa* survives! *l.c.*, xxxi., 95, 1922. Botanical Notes from S.-E. Wexford, *l.c.*, xxxi., 100-2, 1922.

Stephenson, T. & T. A. Hybrids of *Orchis purpurella*, in Journ. Bot. 33, 1922. *O. insignis* (*O. purpurella* × *latifolia*). Aberystwith and Arran. *O. formosa* (*O. purpurella* × *ericetorum*). Ambleside and Arran. *O. venusta* (*O. purpurella* × *Fuchsii*). Aberystwith, Ambleside, and Arran. *O. Orchigymnadenia varia* (*Gymnadenia conopsea* × *O. purpurella*). Arran. Three figures are given.

Storey, F. W., and Wright, K. M. South African Botany. 2nd edition, pp. vi., 220, with six plates in colour and 113 text illustrations. Longmans, Green & Co., London, 1922; 6/6. This is not a Flora or a description of African plants, but is a handy little volume on plant structure and physiology, a chapter being devoted to Classification. The Families described are those prescribed in the syllabus for Matriculation in the Cape University. The appendix gives methods for preparing plants for the herbaria.

The examples chosen for illustration are plants of the Cape. That it is a serviceable text-book is shown by the demand for a second edition.

STOUT, Mrs CHARLES H. THE AMATEUR'S BOOK OF THE DAHLIA. pp. 314, tt. vii. W. Heineman, 1922; 10/6. From the foreword we quote: "For you, dear friend, amateur of the Dahlia, this book is written. You are rich beyond millions, with God's treasures; yet you know it not. Your wealth is stored away, and this key is made to fit the lock of your treasure house. Your questions, asked often with shy apologies, needed no apologies: they taught me how to fashion the key, and I am grateful. So open wide, dear friend. Take these God's gifts for the asking. One flower cannot represent the race; one variety is not the whole species. Have abundance—and share it with all who come your way. Plant your seeds and your bulbs, and the great Artist will come down and work with you. Your hoe will become a wand, and beauty will spring from the brown dead earth which you have touched. He will break up the rainbow and paint the blossoms with the pieces; and you will feel a thrill of joy at thought of partnership with Him who made the world so beautiful." The Dahlia was discovered in Yucatan in Mexico by the Spanish when in 1570 Philip II. sent Francisco Hernandez to study that country. After Hernandez' death there was published "Quatro libros de la naturaleza y virtudes de las plantas y animales que estan recevidos en el uso de medicina en la nueva Espana," but it was not until the edition printed in Rome in 1651 that the two varieties of Acocotli and Cocoxochitl were included. These are the earliest figures of the plant of which they seem to be cultivated varieties. In 1789 the first seeds reached Europe and they were cultivated in the Royal Gardens at Madrid by the Abbé Cavanilles. That eminent botanist named the Dahlia after Andreas Dahl, a Swedish botanist, then living in Berlin, giving it the specific name *pinnata*. It was figured in his splendid "Icones" in 1791. At that time the Earl (not the Marquis) of Bute was Ambassador at the Spanish Court. Jack Boot, as he was irreverently called, was a patron of Botany, and of botanists, notably Sir John Hill, but the Marquisate was not given him till 1796. Lady Bute sent some seeds home about 1790. These did not germinate, but

Lady Holland sent others in 1804 from which the first Dahlias were grown in Britain. In 1872 the Cactus Dahlia was introduced. The home of three out of the eight species of Dahlia known (there are over 4000 varieties now catalogued) is the Terra Fria in Mexico where, at Pedigral, at an elevation of 6000 feet, there are found acres and acres of them in every hue and colour. "For successful culture they must have two things, fresh air and moisture. An open, level bit of land bathed in the morning sun, a few tall trees to shade them shortly after noon, a gentle rise of the ground at the back perhaps which will shed its overplus of rain upon the beds and the site is ideal." In a similar situation, as at Mr Reginald Cory's garden at Duffryn, in Glamorganshire, Dahlias may be seen in such dazzling variety as to make the observer almost gasp at the colouring. The book can be very strongly recommended to any who are interested in Dahlia culture. It is by no means dry reading.

TAHOURDIN, C. B. Some Notes as to British Orchids, 1921. The author gives records of the occurrence of the various British Orchids and remarks upon their scarcity or abundance. His correspondent was unable to find *Liparis* from Ham Ponds, but the plant may well have once occurred there. Of *O. hircina* he says, Mr Fox has successfully raised it from seed. In a Canterbury specimen there was no trace of purple on the ' ribbon.' A specimen from near Lewes had 96 flowers. It has also been noted from East Sussex and near Steyning, and near Bures in North Essex in 1919. In the 1922 Notes are good photographs of ' *O. latifolia*,' *O. praetermissa*, *O. ericetorum* (the true *maculata*), and *O. hircina*. He records from Aldsworth *O. incarnata* × *praetermissa*. He was unable to find *Cephalanthera rubra* at High Elms, Kent.

TANSLEY, A. G. ELEMENTS OF PLANT BIOLOGY. Cr. 8vo, pp. 410. Allen & Unwin, London, 1922; 10/6.

THELLUNG, Dr ALBERT. Zur Terminologie der Adventiv und Ruderalfloristik, in Allgem. Bot. Zeitsch., p. 36, 1918-9. Received March 13, 1922. Herborisation à Zermatt, in Le Monde des Plantes, n. 23, p. 138, 1922.

THOMPSON, H. S. Changes in the Coast Vegetation near Berrow, Somerset, in Journ. of Ecology, x., 53-61, 1922.

Thomson, Hon. G. M., M.L.C. The Naturalisation of Animals and Plants in New Zealand. pp. x., 608. Cambridge University Press. 1922; 42/-.

Thurston, Edgar, C.I.E., and Vigurs, C. C., B.A., M.D. A Supplement to F. Hamilton Davey's Flora of Cornwall. Reprinted from Journal of the Royal Institution of Cornwall, vol. xxii., pp. xx., 172, 1922. Despite the laborious work at the county flora by Davey and the multitudes of botanists who from time to time explored the delectable Duchy and whose records were fully quoted in the Flora, yet in the 12 years which have intervened since its publication, thanks to the persevering efforts of the compilers, a large and important number of additions are entered in these pages. Mr Thurston, it may be well to say, has spent several years in making a representative herbarium of county plants which he has generously presented to Kew, where they are separately stored, so that they can be easily consulted. An analysis of the Additions works out as follows:—Species recorded in the Flora as 'doubtful or an error' and which are now included are *Isatis tinctoria*, *Silene conica*, *Arenaria tenuifolia*, *Medicago minima*, *Senecio squalidus*, *Chenopodium glaucum*, *Euphorbia Esula*, which are probably not indigenous, and *Malaxis paludosa* and *Nitella gracilis*, which are indigenous. The plants which are claimed as British and not recorded in the Flora are *Thalictrum dunense*, *Fumaria paradoxa*, *F. neglecta*, *Viola epipsila*, *Dianthus deltoides* (casual), *Rubus Scheutzii*, *Pyrus intermedia* (alien), *Hieracium Peleterianum*, *H. silvaticum* W. & N. (Gouan is the authority), var. *microladium* Dahlst., *Verbascum pulverulentum* and *Veronica triphyllos* (but neither native), *Euphrasia Kerneri*, *E. stricta* (this is very doubtful), *E. confusa*, *Ajuga pyramidalis* (alien). [This proves to be *A. genevensis* L.] *Salicornia appressa*, *Sagittaria*, *Agrostis verticillata*, *Mibora*, *Poa palustris* (the last three adventive), *Isoetes Hystrix* (a solitary specimen), and *Chara delicatula*. *Atropis festuciformis* is probably a variety of *Glyceria maritima*. *Fumaria muralis* and *Hieracium brunneo-croceum* are in the Addenda. The British varieties have been increased by 142, hybrids by 17, and the alien species and varieties to 110, to which may be added the seven mentioned among the British species.

This makes a splendid addition to the already large Flora. It may be added that *Diotis*, which was thought to be extinct, still occurs. There is a very appreciative memoir of Davey by Dr Vigurs, which puts the botanical side of Davey's life in a clear and concise form. We heartily congratulate the compilers at the completion of a very laborious undertaking. The Supplement will surely increase the number of botanical visitors to Cornwall.

TRELEASE, Prof. W. PLANT MATERIALS OF DECORATIVE GARDENING. The Woody Plants. Edition 2, pocket size, pp. xliii., 177. University of Illinois, 1921, 1 dollar, post paid by author from Urbana, Illinois. WINTER BOTANY, 2.50 dollars. In these two portable volumes, measuring 4½ by 6 inches, the author has given keys by which a large number of North-Eastern American trees can be run down to their respective species. The terms used are simple and the directions are extremely clear. There is a useful glossary. In "Winter Botany" the author has given some excellent drawings of the winter-buds and other details. This part is arranged in systematic order, and under each genus the chief members of it have given the contrasting characters as exhibited in winter. Under *Salix* 13 species are described. The key runs:—

1.	Weeping	2.
	Not markedly weeping	4.
2.	Twigs very slender, glabrous	3.
	Twigs stout, villous	*S. caprea-pendula.*
3.	Buds alternate	(1) *S. babylonica.*
	Buds often opposite	*S. purpurea.*
4.	Buds large, 5-10 mm. long	5.
	Buds moderate, 4-6 mm. long	7.
	Buds small, scarcely 3 mm. long	9.
5.	Buds rather sharply two-winged	6.
	Buds plano-convex	(2) *S. missourensis.*
6.	Buds, green and red, planted	(3) *S. caprea.*
	Buds blackish, native	*S. discolor.*
7.	Buds frequently opposite	*S. purpurea.*
	Buds always alternate	8.
8.	Twigs glossy, olive, glabrous	*S. lucida.*
	Twigs dull, velvety	*S. incana.*
9.	Trees: Twigs mostly glabrescent	10.
	Shrubs: Twigs gray-velvety	13.
10.	Twigs olive-green	11.
	Twigs golden	*S. vitellina.*
	Twigs red	*S. vitellina Britzensis.*
11.	Large open trees	12.
	Slender, pole-like	*S. longifolia.*
12.	Trunks mostly clustered	*S. nigra.*
	Trunk single: twigs sometimes velvety	*S. alba.*
13.	Buds, 3 mm. long	*S. humilis.*
	Buds, 2 mm. long	(6) *S. tristis.*

Under the Poplars nine species, three varieties, and one hybrid are similarly treated. *P. nigra* has the twigs rather slender and of moderate growth, while *P. deltoides monilifera* has them stout and the tree is of large growth with the buds glabrous. In *tremula* these are somewhat downy, in *canescens* the tomentum is gray, and in *alba* it is white.

TROUP, Prof. R. S. Report on Forestry in Kenya Colony and in Uganda. Crown Agents for the Colonies, 1922 ; 5s each.

TURRILL, W. B. Notes on Cyperaceae. *Pycreus pumilus* and *P. hyalinus*, in Kew Bull. 122, 1922. *Isotheca*, gen. nov., described in Decades Kewenses, Kew Bull. 187, 1922, from Aripo, Trinidad, with one species, *I. alba* Turrill.

UNITED STATES DEPARTMENT OF AGRICULTURE. Check List of Publications of the State Agricultural Experiment Stations on the subject of Plant Pathology, 1876-1920. Compiled in the Library of the Bureau of Plant Industry, April 1922. LIST OF FUNGI (Ustilaginales and Uredinales). Prepared for Exchange. Dept. Circular N. 195, February 1922.

VACHELL, ELEANOR, F.L.S. The Leek—The National Emblem of Wales. Cardiff Naturalists' Society 26, 1919. This gives a very complete history of the Leek in Welsh History, and Miss Vachell dismisses the claims of the Daffodil, *Narcissus Pseudo-Narcissus*, to be the Welsh Leek holding, as she does, and assuredly correctly, that it is the leek *Allium Porrum*, itself perhaps a cultivated race of *Allium Ampeloprasum*. The Leek is mentioned in the leech-book, Meddygon-Myddveu, of the 12th century.

VALLENTIN, Mrs E. F., and COTTEN, Mrs E. M. ILLUSTRATIONS OF THE FLOWERING PLANTS AND FERNS OF THE FALKLAND ISLANDS. tt. 64, Mrs Vallentin. Lovell, Reeve & Co., 1921 ; £4 4s.

VEGETABLE RENNET. In Nature (543. 1922) R. Hedger Wallace, 4 East Grove, Cardiff, asks for the names of plants used in various countries for coagulating milk in place of rennet. Of the British species used for this purpose he names *Galium verum*, *Carduus nutans*, *Datura Stramonium*, and *Pinguicula vulgaris*. The foreign species include *Withania coagulans*, *Ficus Carica*, *Cnicus Benedictus*, *Cynara Cardunculus*, *C. Scolymus*, *Drosera peltata*. *Pisum sativum*, *Lupinus hirsutus*, *Ricinus hirsutus* (sic ? *communis*), *Leucas Cephalotes*, *Crotalaria Burhia*, *Rhazya stricta* and *Streblus asper*. To these may be added *Drosera rotundifolia*.

VELENOVSKY, Prof. JOSEF. BOHEMIAN MUSHROOMS, 4 vols., pp. 920, Prag, 1920-22.

WATERFALL, CHARLES. Plants from the County of Cheshire in his Collection, 1910-14. Reprint.

WARD F. KINGDON. His Sixth Expedition in Asia, in Gardeners' Chronicle. Eighth article, 1922.

WATSON BOTANICAL EXCHANGE CLUB. Thirty-eighth Annual Report, 1921-2. Distributor, W. R. Sherrin. Contains a key to British species of *Juncus* by the distributor.

WHITE, J. WALTER. Obituary (with portrait) of Cedric Bucknall, in Journ. Bot. 65, 1922.

WILLIS, J. C. AGE AND AREA. A Study in Geographical Distribution and Origin of Species, with chapters by Hugo de Vries, H. B. Guppy, Mrs E. M. Reid, and Prof. James Small, pp. viii., 260, Cambridge University Press, 1922; 14s. On the cover the author says " he has endeavoured to free himself from the trammels of the natural selection theory and to work as if he had found himself in another planet where scientific investigation was just beginning." As he says in the preface when he took up the study of distribution he found that the current theories provided an explanation that was not only unnecessarily complex but one that did not explain. Gradually it was borne in on him that plants spread very slowly, but at an average rate, determined by the various causes acting upon them, so that age forms a measure of dispersal when one is dealing with allied and similar forms. Age as explanation of spread, is enormously simpler than natural selection. Nine chapters are devoted to " The Present Position of Age and Area." The theory, like so many others, is not new, Lyell, in 1853, and Hooker, in the same year, came very near to the same conclusion and, as Dr Willis very generously says, "had it not been for the appearance and rapid rise of the great theory of Darwin, with its inevitable diversion of effort into other, and at the time, more profitable lines, it is evident that Hooker or some other worker of an earlier time would have discovered not only the principle which I have termed Age and Area, but also the many and remarkable conclusions to which it leads." Observations on the species found on pollard-willows, Dr Willis claims, show that even a barrier of distance so small as the ground is to the willow-top effectually prevents the spread of many species. He never noticed the Daisy and Clover on them, nor yet the Orchid. The majority consisted of fleshy-fruited plants, bird-carried, while the Dandelion as a type of wind-specialised fruits was frequent. Surely Dr Willis has not taken into account two important factors—soil and sunlight. The first, as it occurs on the willow-top, consists of humus in which mineral constituents are well-nigh absent, and (2) the shade afforded by the foliage is fairly complete. Again, there is little moisture. Thus the conditions are inimical to the growth of the plants mentioned. A twelve-foot wall is not a barrier to a daisy, for I have seen plants growing on such an one, and it is inconceivable to believe that such a small elevation as a pollard-willow is too much for the wind to convey an Orchis seed when we know they are blown for long distances to a shingly shore, but many seeds fall on unsuitable soil and they die. On Ritigala, in Ceylon, a solitary precipitous peak about 40 miles from the main mountain-mass in Ceylon, of the 103 wet-zone plants growing there 24 had fruits suitable for bird-carriage, 49 had light fruits fitted for wind dispersal, 40 were doubtful. Here 30 plants were carried 40 miles most probably by birds. Krakatau, in 1883, was sterilised by the famous eruption. Three years after Dr Treub found 11 spore-carried ferns, 9 flowering plants, growing on the shore, current-borne, and 8 growing inland, four of these being wind-carried Composites, 2 Grasses, *Phragmites* and a *Pennisetum*, likewise wind-borne, *Phragmites*, and two fleshy-fruited species bird-carried. Eleven years after there were 50 flowering plants, 30 due to sea and 16 to air-carriage. In 1905 the number had increased to 137, but the distance proves a serious barrier since Java possesses 5000 species. Thanks to the virgin soil, Krakatau received and nourished a larger number than Ritigala offers even after an indefinite period of time, dating back to the Tertiary period. Dr Small has shown that the distribution of Composites is favoured by the pappus fruit being able to float about two miles an hour for an indefinite period, so long as the relative humidity of the air remains at a figure that keeps the pappus open, but if the humidity increases the pappus closes and the fruit falls, hence a barrier to long sea-journeys. Ridley's observations on *Shorea*, a tree a hundred feet high, show that it was not able to scatter its fruits freely beyond a hundred yards. Therefore it would take 60,000 years to migrate a hundred miles; slower than a glacier or the L. C. & D. The argument of Dr Willis is that immense time is needed for plant distribution. He says that 4000 areas of a square yard each (or of a single acre) upon a moor or forest would not receive 80 new species in a hundred years even though these might be growing within 200 yards. "It is doubtful if they would even receive one or two." Nor would an area equal in size to Krakatau of a tropical savannah receive 137 new species in less than 40 years. It is a completely incorrect view to think of plants in general as travelling rapidly about the world, in fact dispersal is a very slow process. Of the ten largest families in the world only the first two, the *Compositæ* and *Orchidaceæ*, are remarkable for the possession of extra good methods of dispersal, yet they have the largest number of genera. This fact, he says, goes to show that dispersal has not altogether depended upon the possession of a good 'adaptation' for the purpose and also when one takes long periods and large numbers it is to a marked degree mechanical. Hooker in 1888 wrote, "The conditions which have resulted in Monocotyledons retaining their numerical proportion of 1 to 4, or thereabout, of Dicotyledons, in the globe and all large areas thereof, are, in the present state of science, inscrutable." Mr Willis sums up by saying that more than half of the most cosmopolitan genera have little or no mechanism for dispersal, and this is not well marked, on the whole, in the largest and most widely distributed families. A fascinating chapter is devoted to the causes which favour or hinder Dispersal. He says that *Festuca ovina* is so abundant and successful upon the chalkdowns that one is tempted to think it is a chalk plant till one finds it almost as common upon a bilberry moor in Derbyshire or a grass moor in Scotland on a peaty soil. Does not this raise the question, are the chalk plant and the peat-moor plant identical? I have long believed them to be distinct species and that each might be used as an index to soil-condition, *F. ovina*, the calcareous species, *F. tenuifolia* or *paludosa*, the acid-soil plant. Comparative culture for several generations is needed to settle this question which is not less important to the ecologist than it is to the agriculturist. Nor are we convinced that distribution is so slow as he contends. Twenty years sufficed for *Elodea* to be dispersed through Britain.

The Age and Area rule is thus summarised :—" The Area occupied at any given time, in any given country, by any group of allied species at least ten in number, depends chiefly, so long as conditions remain reasonably constant, upon the ages of the species of that group in that country, but may be enormously modified by the presence of barriers such as seas, rivers, mountains, changes of climate from one region to the next, or other ecological boundaries, and the like, also by the action of man, and by other causes." He claims he has proved this by prediction of plant occurrences in New Zealand and the adjacent islands. Dr Small contributes an erudite article, and concludes by saying that so far as the Compositæ are concerned on the whole, both the average generic area and the average number of species or genera are closely related to absolute age. Endemism affords a delightful chapter. One of the very local species mentioned is *Campanula Vidalii*, which an old Secretary of this Society discovered on rocks near Flores in the Azores. It also grows on S. Maria and it was reported from S. Miguel, but the local botanists had never seen it there. In climbing up a lava wall on the north side of the island I saw it growing on the precipitous sea-cliff in some quantity, but it is known from nowhere else in the world. Madagascar has 266 endemic genera, South America and Africa about 1730 each. Islands have the smallest proportion, and he holds that endemic species and genera are young beginners, and probably the descendants of other genera still existing. There are 4853 monotypic genera or 38.6 per cent., 1632 ditypes and 921 tritypes, while at the other end there is the gigantic genus *Astragalus* with 1600 species. One has only been able to skim the contents of this suggestive work, but enough has been said to show that it is a volume which all systematists should possess. Dr Willis has elsewhere dealt with such problems as those afforded by some of our very local species. *Lychnis alpina*, *Oxytropis campestris*, *Astragalus alpinus* and *Lloydia* may be the battle-ground for those who may think them relics of a widely distributed species or for others who consider them recent arrivals. Whether in the latter case wind or birds have been the dispersal agent has to be thrashed out. They stand in a different category to *Hydrilla*, *Eriocaulon*, *Tillaea aquatica*, and, perhaps, *Naias marina*, for it requires no stretch of imagination to attribute the occurrence of the latter to waterfowl, especially as a seedless plant like *Elodea* has been carried over the whole of Britain and to upland tarns and lochs many miles distant from the nearest habitat and all in less than a century. As regards sea-dispersal one must not forget sea-spume dispersal, which is a more important factor than is generally understood. Small seeds are entangled in this and the effects upon such wind-swept areas as the Shetlands and Faroes must be considerable.

WILLIS, Dr J. C. AGE AND AREA. See Nineteenth Century, October, 1922. He says that Natural Selection "has received so severe a shake that it is no longer a name to conjure with."

WILSON, A. West Yorkshire Botanical Notes, in Naturalist 397, 1922. He records *Hedera Helix* at 1570 feet on Cantley Crag, with *Lonicera Periclymenum*.

WILSON, ERNEST H. THE ROMANCE OF OUR TREES. Doubleday, Page & Co., New York, 1920.

WRIGHT, WALTER P. PRACTICAL GARDENING. For Pleasure and Profit. Six volumes. The Educational Book Co., Ltd.; £4 5s.

WRIGHT, HORACE J., and WALTER P. BEAUTIFUL FLOWERS AND HOW TO GROW THEM. Illustrated with 32 plates in full colours from paintings by Beatrice Parsons, Eleanor Fortescue Brickdale, Hugh L. Norris, Margaret Waterfield, A. Fairfax Muckley, Francis G. James, Anna Lea-Merritt and Marie Low, pp. 402, T. C. & G. C. Jack, London and Edinburgh; 10s 6d. In the seventeen chapters the authors give in a pleasing way much useful information about the cultivation of those plants which are more commonly met with in gardens. Incidentally many interesting literary references and thoughtful observations are added. "Roses" form the subject matter of the first chapter, "Bulbs" that of the second, and here the Lilies and Tulips are well treated. The third is devoted to "Hardy Herbaceous Plants,' a group especially attractive to those of narrow means, but it is not every one who can afford a bed 'twelve feet wide,' which is recommended. To those who can, a splendid effect is produced. Let any one who can, visit the noble herbaceous border at Goodwood with its magnificent clumps of Salvia, Delphiniums and Thalictrums, and he will not regret the old days of carpet bedding. To illustrate the herbaceous border there is a beautiful picture of the Christmas Rose and *Chionodoxa*, a little sheltered by Fern in the bed at Kew Gardens. One is glad to see due praise given to the *Kniphofia*. I shall never forget a border of it in Madeira outlined against the blue sky. It formed one of Miss Acland's most successful pieces of colour photography. Alas! the slide was smashed in showing it to Dr Graben, but one can still call to mind the wonderful colour scheme that garden displayed. Another charming picture represents the *Hippeastrum* with its glorious display contrasting, as it does most effectively, with its companion, the feathery *Spiraea*. "Rockery Plants" have a short but useful chapter and "Greenhouse and Hothouse Flowers" are dealt with at some length. "Window and Room Plants," "Carnations," "The Dahlia" and "Sweet Peas" are adequately dealt with. "Annuals," whose name is legion and whose colours are those of the rainbow, have a selected list given, as also have "Half-Hardy Annuals." There is a chapter on "Water Lilies and other Aquatic Plants," where it is shown how successfully even in a small garden Water Lilies may be grown. "Arches, Pergolas, Pillars and Stumps" and "Beautiful Walls and Fences" are treated of, and the chapters abound with practical suggestions. "Orchids" are a class by themselves, and their devotees should be richly endowed, but "The Chrysanthemum" appeals to a wider circle, and for cultivation a representative selection is given. "Tender Bedding Plants" are appreciatively dealt with, and the chapter will appeal strongly to the readers of this charming book. Another excellent treatise is that on "Flowers for Suburban Gardens." One of the many beautiful pictures represents a garden at Hampstead painted with great feeling by Beatrice Parsons and excellently produced, as is her beautiful group of Yuccas and Kniphofias. There is a good index to the work which will prove an acceptable gift book to any garden-lover.

YAPP, R. H. The Dovey Salt Marshes in 1921, in Journ. of Ecology x., 18-23, 1922.

OBITUARIES.

BALFOUR, Sir ISAAC BAYLEY, F.R.S., D.Sc., LL.D. Born at Edinburgh, March 31, 1853; died at Courts Hill, Haslemere, November 30, 1922. He was educated at the Edinburgh Academy and at the Universities of Edinburgh, Strassburg, and Würzburg. In 1874 he accompanied the Transit of Venus Expedition to Rodriguez. In 1879 he was appointed Professor of Botany at Glasgow, and in 1880 he explored the island of Socotra. There he discovered many new species. The King of the island gave him specimens of *Aloe Perryi*, but as it contained little Aloin its commercial value was small. A set of his Socotra plants is at Oxford, where is also preserved his herbarium of Scottish plants, collected when a student. In 1884 he was appointed to the chair of Botany at Oxford, where he soon made his presence felt, the old connection of the Baxters with the Gardens ceasing, the younger Baxter having to leave. The old arrangement of the beds, in which the plants were grouped according to the Linnean system, was changed, not without losing something by it. The changes were made so rapidly that doubtless, if further consideration had been given, the glass-houses might have been relegated to the island across the Cherwell and the Gardens made to resemble more closely what they were in the time of Morison without in any way sacrificing their scientific utility. The collections, also, nearly suffered " re-arrangement." The first intention was to put all the various collections, chiefly of interest as they were from their historic associations, into one general herbarium : a plan which if used for modern and properly identified specimens is doubtless advantageous. Remonstrance was almost useless. I had no official relation then with the place. But something had to be done to avoid putting the Morisonian and Dillenian collections into chaos, so the Du Bois herbarium was allowed to be cut up—a child thrown to the wolves, and it saved the rest. But he was a great stimulus after Lawson's lethargic regime. He was one of the chief promoters of the "Annals of Botany," of which he was one of the editors from its start. Chiefly owing to his recommendation an honorary M.A. was conferred upon our local bryologist, Mr Henry Boswell. In 1888 he was appointed Professor of Botany at Edinburgh, and King's Botanist and Regius Keeper of the Royal Botanic Gardens, Edinburgh, offices which had been held by his father, John Hutton Balfour, so long known to his students as "Woody Fibre." In the thirty-four years Isaac Balfour held the chair he exerted a wonderful influence. He was ceaselessly active; he made a most beautiful and popular rock-garden; he stimulated collectors to send in their gatherings; he worked out the Rhododendrons and Primulas from China—that inexhaustible storehouse; and he had the various herbarium specimens sent him carefully examined for seeds and in this way succeeded in raising many rare and some new species by his scientific methods of propagation. On our Phyto-geographical Excursion through the British Isles in 1911 he royally entertained us not only with haggis but with many a rare vegetable and fruit, and the foreign members were greatly impressed with the Gardens and collections as well as by the hospitality and the acute observations of the highly accomplished King's Botanist. There was present at this dinner also his charming and only son, a Magdalen College student, who had the ball at his feet, but like so many another of our golden youth died during the great war, leaving a blank in his father's life which was never filled. Professor Balfour was created K.B.E. in 1920, and retired from the offices which he held at Edinburgh at the end of last March. He was a clear and able lecturer, and was one of our greatest systematists. Balfour was a good correspondent, and an able critic. It was at his suggestion that the "Memoir on George Don" was published as a Blue Book, and, in a letter respecting it, he adds that "as a matter of fact I have been accumulating for several years, at odd times, material for a complete history of the Botanic Garden here which of course includes an account of the lives of the chief members of the staff at different times, and I had, therefore, got together some facts about Don, but my information about him was far less complete than yours. I am able, however, to fix definitely when Don came to the Garden. John Mackay, who was superintendent before Don, died on the 14th of March 1802, and Don must therefore have been appointed after that date. . . . The name of George Don appears in the list of the chemistry class, but not as studying medicine.'' One of the last letters from him was one saying :—'' My dear Doctor, —Thank you for the account of the Herbarium at Oxford. I am very pleased to have it. It is a splendid record. What an advantage it would be if a like account were published of all herbaria! I am sorry to say that the past few years have been so strenuous that I have not done any botanising in Scotland during the period—a great deprivation. I am glad you are continuing to add to our flora and solving problems of what forms really are which have puzzled so many of us in the past.''

BOTTOMLEY, WILLIAM BEECROFT, Ph.D. Born at Apperley Bridge, Yorks, in 1863; died at Huddersfield, March 24, 1922. He was educated at the Royal Grammar School, Lancaster, and King's College, Cambridge. For some years he was lecturer on biology at St Mary's Hospital Medical School, then a University Extension school. He became Professor of Biology at the Royal Veterinary College, St Pancras, and in 1893, on the retirement of Richard Bentley, Professor of Botany at King's College, a chair he only relinquished, owing to ill-health, in 1921. He contributed several papers to the Royal Society on his researches into nitrogen-fixing organisms for the supply of food to the soil, and he devised a bacterial test for plant food accessories. Other papers treated of ''Some Effects of Organic Growth-promoting Substances,'' and ''On the Growth of *Lemna minor* in Mineral Culture Solutions.'' He also found that he could set free humic acid by the action of certain decomposition bacteria, and from this he hoped to have great practical success in soil treatment.

BOULGER, Prof. GEORGE SIMONDS. Born at Bletchingley, Surrey.

in 1853; died suddenly at Richmond, May 4, 1922. He was educated at Wellington and Epsom Colleges, and when quite young became Professor of Natural History at Cirencester, where he was for thirty years. He was also Professor of Botany and Geology at the City of London College, and a lecturer at the Imperial Institute. He was Vice-President of the Selborne Society and of the Gilbert White Fellowship. His most useful work was (in collaboration with Mr J. Britten) *A Biographical Index of British and Irish Botanists*, which ran into two editions and three supplements. He edited Johns' *Flowers of the Field*, which has been a popular help to a wide circle of readers. He also wrote the text for Mrs Henry Perrin's beautiful paintings of *British Flowering Plants* in four volumes, and *The Country, Month by Month*, was a quite pleasing publication, which he wrote in collaboration with J. A. Owen. His *Familiar Trees* ran through two editions. His wife was a delightful writer and, by Professor Boulger's consent, I published the most sympathetic and vivid memorial sketch of the Rev. W. W. Newbould (which was written by her for the *Journal of Botany*) in my *Flora of Berkshire*. Boulger had a fair knowledge of British plants and described a variety of *Erica cinerea* (*Journ. Bot.* 315, 1912) as *schizopetala*, which is a teratological condition rather than a true variety. I had previously recorded it in the same *Journal* (352, 1902) but gave it no name. Professor Boulger's kindness of manner and intelligent interest in science endeared him to a large circle of friends.

Bryce, Viscount James, O.M., G.C.V.O., P.C., D.C.L., LL.D., F.R.S. Born at Belfast, May 10, 1838; died January 22, 1922. His father was headmaster of the High School at Glasgow, and there James was educated. He proceeded to the University and then came to Trinity College, Oxford, where he had a brilliant career, taking a first in Mods and a double-first in Greats, winning the Craven and Vinerian Scholarships, the Gaisford Prize for Greek Verse, and the Arnold Prize for his essay on the Holy Roman Empire—a work which was afterwards translated into several European languages. He was elected a Fellow of Oriel in 1862. In 1867 he was called to the Bar, and became Regius Professor of Civil Law at Oxford in 1870. Not only was he a brilliant scholar, but he was a great traveller and a skilled mountain climber, a man of untiring energy and with interests numerous and world-spread. He loved the land he travelled over, and much of it was rarely traversed ground. and this he could describe in a very vivid manner. Among his early publications was a graphic account of Transcaucasia and Ararat, written in 1877. This historic peak, the meeting point of three great empires, said to be an extinct volcano, the summit of which is 17,000 feet above sea-level, with perpetual snow at the high level of 14,000 feet due to the small rainfall, is composed of igneous rock. It is graphically described by Bryce, who states that it was first ascended in 1829 by Fredric Parrot. The mountain is exceptionally grand since the massif rises from " a wide sea-like plain " about 2500 feet only above the sea, hence 14,500—the height of the Matterhorn—is in view, and it has no rival in its vicinity. Bryce's companions were left behind at 12,000 feet, and he climbed alone the last 5000 feet—a testimony to his bravery and powers of endurance. On his way at 14,000 feet he saw a species of *Cerastium*. Although he did not find the ark he met with a piece of wood "which might be gopher wood," on which he humorously descants, but some of his readers took it seriously and many made applications for a fragment of the relic, " which as relics go " the argument for its being a piece of the ark is " exceptionally strong." In 1885 he entered Parliament as member for the Tower Hamlets by a large majority, which to some extent was owing to his addressing a meeting of German master-bakers in their own tongue. In after days it was his fate to be the chairman of a small but distinguished committee on alleged German outrages. The report as issued by it was a denunciation of the atrocious action of the German Army in Belgium, and the hope was expressed in it that the nations of the world in council might devise methods to prevent the recurrence of war. In 1888 he issued an important work on the American Commonwealth, which commanded a large circulation in the States. In 1897 he published his *Impressions of South Africa*. In 1907 he became member for South Aberdeen, and in Mr Gladstone's Cabinet of 1892 he was appointed Chancellor of the Duchy of Lancaster. In 1894 he became President of the Board of Trade. In 1905 he was made Chief Secretary for Ireland, an office which he held for two years. Nor was it, as has been in so many instances, the grave of his reputation. Mr Campbell Bannerman, who may be credited with a great act of statesmanship in his treatment of the South African difficulty, had also the prescience to see that in Bryce no better Ambassador could be found to represent Britain in the United States and thus, without a previous acquaintanceship with diplomacy, Bryce served our country in that important capacity for seven years. His auguries were not of the happiest, but during his residence he conquered America, or rather American sentiment, and was paid the compliment of learning the hidden mysteries of its statecraft, and he acquired an almost unrivalled knowledge of its inner machinery. It is said that he visited every State in the Union, and wherever he went he was welcomed. On almost the last occasion I met him he had come to Oxford as President of the American Club to give an address at the Union, and there for an hour without a written note he explained the relation of the American President to his Foreign Office and showed how much greater was the power of the President in dealing with matters of foreign policy than our own Premier. In this lengthy and well phrased discourse not a word was said which could touch the sensibility of the most thin-skinned of his hearers. Yet at the back of it all one could imagine how, as was the case with Page, he must have girded at the intricate workings of a mind like that possessed by the silver-tongued idealist, President Wilson. To no one more than to Bryce is due the whole-hearted support of the Allies which America eventually gave. After the address one would have thought Lord Bryce would have been tired out. Instead of that he talked to me for a long time on the beauties of the Scottish flora, of the climbs on the Breadalbanes and Cairngorms and his delight at hearing of the additions which had been made in recent times to the Scottish Flora. And Lord Bryce was no mean botanist. One of his earliest contributions to literature was "A Flora of the Isle of Arran," which was published in 1859. When he visited Pekin, Freshfield tells us that the attachés were prepared to answer questions about Chinese politics but were dismayed to find information about the local flora was demanded of them, and this interest in botany was retained to his latest days as an extract from his letters will show. "Though I belong to so many societies that I made a vow two years ago to join no others I cannot resist your persuasions to become a member of the Botanical Society.

The preservation of our rare species is now a matter of the highest consequence. I fear many are extinct. In Clova, four years ago, I failed to find nearly all of the rarer species which were known there in 1855 and fear they may have been destroyed by collectors long ago as *Menziesia* so nearly was. I was shown not long ago a frond of *Cystopteris montana*, stated to have been gathered on Skiddaw within three miles of Keswick. We have an interesting and peculiar flora in this forest [Sussex] of a Cumbrian or West of Scotland character." This latter note was written only last year. In 1912 he made a journey from Panama to Argentina and Brazil by the Straits of Magellan. His account of this forms a most excellent and readable book of travel, full, as it is, of information, and it is also an evidence of his broad and sympathetic judgment. Douglas Freshfield, in his memorial notice in *Nature* (14, 1922), quotes one of Lord Bryce's sentences from this work as an example of his style—"The blue of Titicaca is peculiar, not deep and dark as that of the tropical ocean, nor opaque like the blue-green of Lake Leman, nor like that warm purple of the Ægean which Homer compares to dark red wine, but a clear, cold crystalline blue, even as is that of the cold sky vaulted over it. Even in this blazing sunlight it had that sort of chilly glitter one sees in the crevasses of a glacier; and the wavelets sparkled like diamonds." But Lord Bryce was more than a botanist, or a traveller, or a University scholar: he was a statesman of a high order. Years ago Gladstone gave the Romanes Lecture in Oxford. It was shortly after the death of a Royal Personage. The Sheldonian Theatre was packed with an audience clothed for the most part in black. It was a grim cold day and the light, or such of it as came through the Broad Street windows, was focussed on the dark southern doors, against which, on a rostrum, stood Gladstone dressed in his scarlet robes as D.C.L., with his well cut, almost predacious features, and silvery hair, the one touch of colour in the place. The air outside was frigid. He had, for the most part, a hostile audience to face and his reception was scarcely warmer than the exterior atmosphere. Yet with oratorical skill he elaborated the characteristics of the great Universities—Paris, Cambridge, Oxford—and contrasting the two latter said that Cambridge had been the home of poets—Oxford of statesmen. He mentioned that all the Chancellors of Oxford, from the Duke of Wellington to Lord Salisbury, had been Premiers of England. This generous allusion to his great opponent melted the ice and he had subjugated his hearers. Lord Bryce adds another to the list of Oxford statesmen who has done inestimable service to his country. He had visited most countries, had met almost everyone worth knowing, and possessed a very wide and deep knowledge of places and peoples, not only from books but from personal observation, and this was recognised not only in his own country but by the Universities of many lands which showered their honours upon him. Not the least of these was the well-earned encomium passed on him by Sir Edward Grey when he alluded to him as 'the great pacificator.' A lover of liberty in the highest sense as Bryce was he necessarily detested strife, and his concept of liberty is magnificently expressed in his sketch of Lord Acton, from which we quote: "Twenty years ago, late at night, he expounded to me his view of how such a history of Liberty might be written, and in what wise it might be made the central thread of all history. He spoke for six or seven minutes only, but he spoke like a man inspired, seeming as if, from some mountain summit high in air, he saw beneath him the far-winding path of human progress from dim Cimmerian shores of prehistoric shadow into the fuller yet broken and fitful light of modern times. The eloquence was splendid, but greater than the eloquence was the penetrating vision which discerned through all events and in all ages the play of those moral forces, now creating, now destroying, always transmuting, which had moulded and remoulded institutions, and had given to the human spirit its ceaselessly-changing forms of energy. It was as if the whole landscape of history had been suddenly lit up by a burst of sunlight. I have never heard from any other lips any discourse like it, nor from his did I ever hear the like again."

CARRUTHERS, WILLIAM, Ph.D., F.R.S. Born in Moffat in 1830, the son of Samuel Carruthers, a merchant there; died at Norwood, June 2, 1922. He was educated at Edinburgh University with the view of entering the Presbyterial ministry, but he took up science as his life work. He joined the Botanical Department of the British Museum on Robert Brown's death in 1869, and became Keeper in 1871. He was President of the Linnean Society, 1886-90, during its centenary; President of the Royal Microscopical Society, 1900-1, and Consulting Botanist to the Royal Agricultural Society, 1871-1910. He was a member of the Presbyterian Church and formed a considerable collection of works relating to Puritan England. He rendered great service to Agricultural Science by his testing of seeds to determine their germination capacity, and by his work on the vitality of farm and grass seeds.

CODRINGTON, Rev. ROBERT HENRY, D.D. Born at Wroughton, Wilts, September 15, 1830; died at Chichester, September 1922. Noted for his work in Melanesia, of the Mission of which he was the Head. He was a versatile scholar and a man of great natural accomplishments. Although he never published anything on botany he was a great lover of plants and knew much about them. When I saw him last July he was unwell but his mind was clear and his wonderful memory still good. His works on the Melanesian languages and the Melanesians, their anthropology and folk-lore are monumental.

DUTHIE, JOHN FIRMINGER. Born May 12, 1845; died at West Wortling, Sussex, February 23, 1922, aged 76. He was the son of the Rev. A. H. Duthie, Rector of Sittingbourne, and was educated at Marlborough and Jesus College, Cambridge, graduating in 1867. He acted as tutor for a short time and then travelled on the Continent. In 1875 he was appointed Professor of Natural History at Cirencester, and the next year became Superintendent of the Botanic Gardens at Paharanpur where he remained till 1903. He contributed the greater part of the account of the Myrtaceae to the second volume of *The Flora of British India* in 1879. In 1881 he issued *A List of the Grasses of North-Western India*, and in 1886 appeared folio *Illustrations of the Indigenous Fodder Grasses of the Plains of North-Western India*. In the same year he gave an account of a botanical tour in Rajputana, and in 1896 of a botanical tour in Kashmir. In 1903, on his return to England, he was appointed Indian Assistant in the Kew Herbarium, which ill-health caused him, four yeais later, to resign. He published "The Orchids of the North-Western Himalayas" in 1906 to the *Annals of the Royal Botanic Garden, Calcutta* ix., pt. 1, 173 species being enumerated. He was also engaged in writing a *Flora of the Upper Gangetic Plain* of which some portions have been printed in Calcutta. Duthie, in 1871, added a new plant to the British Flora—the interesting *Polygala austriaca* from Wye downs, where it still grows. He also added *P. calcarea* to the Oxfordshire flora from Ewelme downs, as recorded in our *Report* for 1870. His name is connected with *Liparis Duthiei* and *Herminium Duthiei*. He acted occasionally as an examiner in our Botanical School at Oxford but, doubtless from ill-health, he always seemed depressed and lacking in vigour.

ELWES, HENRY JOHN, F.R.S. Born May 16, 1846; died December 3, 1922. He was the son of J. H. Elwes, of Colesborne Park, and married Margaret, daughter of W. C. Loundes, of Brightwell Park, Oxon. His great-grandfather succeeded to a part of the large wealth of the miser Elwes of Marcham. He was educated at Eton and served five years in the Scots Guards, retiring with the rank of captain. He was a great traveller. He had the travelling spirit and was, I think, most at home when he was exploring. He travelled in Turkey, Asia Minor, Tibet, India, South America, Mexico, Chile, Russia, Siberia, Nepal, Sikhim, China, Japan, and Formosa. His travelling was by no means purposeless: a more purposeful person never existed. Tall and strongly made, he was one of the most virile men I have ever met. In conversation he carried all before him as autumn leaves are blown in a gale. He knew places and things and had strong views on most subjects, and they lost nothing in expression. He was an ardent collector of Lepidoptera, and his magnificent collection was given to the Natural History Museum. A big game hunter, one would not imagine that micro-Lepidoptera were much in his line. He was an enthusiastic horticulturist and a vice-president and Victorian medallist of the Royal Horticultural Society. So long ago as 1877-80 he published an excellent and costly *Monograph of the Lilies* which now commands much more than its published price. In it he describes *L. Handsoni* from Manchuria. In Asia Minor he discovered, in 1875, a magnificent Snowdrop which bears his name. I have had the pleasure of seeing it in its native home. His monumental work, however, was that in which he secured the co-operation of Dr Henry—*The Trees of Great Britain and Ireland*, published between the years 1906 and 1913, on the preparation of which he spent much labour and money.

He visited nearly every important estate in Britain in order to measure or have photographed the special trees growing there. In this occupation his almost volcanic energy found a fitting vent. After a heavy day's work, he was ready to start the next day at 7 or earlier! While engaged on the Trees he came to Oxford to see the Garden trees, but was somewhat contemptuous at what he thought Oxfordshire could show. The Magdalen Elms brought him into a less agnostic mind. I took him to Cornbury where he saw the Great Beech, now, alas, like Elwes, no more, and the big Hornbeam and the fine Service Tree. We also went to see the great Plane at Rycote. He was rather dogmatic about oak-panelling, so I took him to Yarnton, and there Mr Franklin, who has done such excellent oak-work in St Paul's and elsewhere, told him that for beauty of grain he considered the Brigstock Chase Oaks of Northants the best in Britain, and showed panels from them which surprised Elwes. He also showed the best way of cutting the wood in order to more efficiently display the grain. I will not say that Elwes was chastened. That could not happen, but he admitted that his visit was not entirely barren. The book, despite its want of arrangement, supplies a great want, and now commands more than twice the original price. Elwes was President of the Royal English Arboricultural Society and of the Entomological Society. He was also admitted a Fellow of the Royal Society. It will be remembered that he was one of those who stepped into the breach in order to prevent the lapse of the publication of the *Botanical Magazine*. In a previous year Sir Joseph Hooker dedicated a volume to Elwes. I had much correspondence with him, and have printed one or two of his letters to show how keen he was. "Can you help us on a point which British Botanists as a rule have seemingly neglected, and that is the distribution of the two forms, generally looked on by German botanists as species of birch? I cannot call to mind any single English author who seems to have paid due attention to the subject and I do not like taking my facts from Germans as so many others do. The only forester whom I know who seemed to recognise them as distinct was Mr Michie, now the King's factor at Balmoral, and he told me that in that district the *B. verrucosa* was confined to rocky and hard ground, whilst *B. pubescens* grew only on boggy, wet land. This is the case in Germany according to the best authority. But in most parts of England the two forms seem mixed, and many of the trees seem intermediate in their distinctive character which is much more apparent in the seedling and juvenile stages than when mature. The bark is supposed to be more silvery in *verrucosa*, but the nurserymen who catalogue " Silver Birch " neither know nor care which the seed comes from, and I think the character of the bark depends much more on the soil, climate and age of the tree. Again, in so many parts of England the birch is planted or has sprung from planted trees and I have no doubt that the two hybridise. One finds the majority of trees so mixed that the character is not sufficiently marked to say which form they belong to, and in consequence most local botanists in England have not distinguished them as regards their habitat. If you can refer me to any exact observations I shall be much obliged. Dr Henry has just been appointed Lecturer on Forestry at Cambridge University, and I have no doubt will do a great deal there as he is a very live man, deeply interested in the subject and personally attractive to young men, which, in a lecturer, is a great point. The English Arboricultural Society, of which I am president, meets next week at Cheltenham and has an attractive programme of excursions. Can I tempt you to join?" Again, October 22, 1910—" We are just finishing the Poplars for vol. vi. . . you are quoted (*Scot. Nat.* 248, 1892) for the occurrence of *P. canescens* in West Inverness. London quotes Macculloch that it is the only tree existing in the Isle of Lewis but I suppose that he mistook *P. tremula*. Can you give me further particulars? Watson seemed to agree with Hooker and Bentham that it was only truly native in the southern and eastern counties, but I believe it is native here as I have both sexes on my property in a place where they are not likely to have been planted." Again, April 29, 1916—" I am much obliged for the trouble you have taken with the *Report* and am glad you have reprinted Henry's paper on the Black Poplar, for it is very strange how little this interesting tree has been noticed by British Botanists, and I am afraid it is everywhere becoming scarcer and may become extinct unless planted. I hope that it may be propagated by cuttings for, though inferior in timber-producing quality to the hybrids, it is a very handsome tree when in flower. . . It is very strange how little we know of the life-history of the British Orchids and I think it would be a most interesting study for some of your readers who have time to note year by year whether they reappear in the same localities; whether they survive after seeding; and how long the seedlings take to flower [I was able to say that *praetermissa* flowered when six years old]. As far as I know no one in England has drawn or described their germination or explained how it is they reappear at long intervals in places where they seem to be extinct. If we can raise the most delicate exotic orchids from seed under glass and hybridise them freely it surely ought to be possible with the British species. You have never paid me your promised visit but I hope you will this summer." He leaves a son, Lieut.-Col. H. C. Elwes, D.S.O., M.V.O.

HAGSTROM, JOHAN OSKAR. Born in Bettna in Sudermania (Södermanland), March 21, 1860; died June 7, 1922. Educated at Ny Koping, he went to the University of Upsala in 1879, entered Holy orders in 1885; did duty at several places, Unite (Kommister), Lysvik in Verinland 1889, and as Vicar in Västra Emtervik. He was the author of Potamogeton in Neuman's *Sveriges Flora* (1901); Potamogetonaceae from Asia (1905); Potamogeton in Lindman's *Svensk Flora* (1918); New Potamogetons in *Bot. Not.* (1908); and the work we know him so well by *Critical Researches on Potamogeton* (1916). No one has contributed so much to the knowledge of the genus, especially in its anatomy, and his splendid work will ever remain a monument to his memory. Not only did he describe many new species but he disentangled many that had been erroneously put together; and he has given the fullest and best account of many species. As an example of good and clear reasoning may be cited his account of *P. panormitanus* Biv. Bern. He did not accept the verdict that it was only a variety but by careful and full analysis showed it was a good species. There is no one at present to take his place. A. BENNETT.

For many years Hagström was engaged in studying the Pondweeds and for this purpose paid especial attention to their anatomical structure. The results are embodied in his very excellent *Critical Researches on Potamogeton* which appeared in the Kungl. Svenska Vetenskapsakademiens Handlingar for 1916, and its excellence was generally acknowledged. Pearsall reviewed it in the *Report*, v., 701. In recognition of these studies the University of Upsala conferred on him the degree of D.Ph., honoris causa. In December 1920 he wrote about some Pondweeds I had sent him "that they were especially interesting and I wished to write a paragraph on them but I have been ill since that time and am at present still lying sick in bed at an infirmary in Stockholm. Further the Shetland Pondweeds need a thorough elaboration before any one writes on them. You have there some strange forms and I should be very glad if you would be so kind as to again visit the isles next summer, gathering all the other species and forms—for instance, Fryer's *cancellatus*, which I have not seen. Then you would come over to Sweden and stay by me and we should work out the Shetland Potam. Flora. I misdetermined a *pusillus*-like plant which is *panormitanus* instead of *pusillus*. Can you help me to get Perth and Inverness Potamogetons? Wishing you a happy New Year. . . J. O. HAGSTROM." "In returning your pondweeds, with many thanks, I will give a list of the most beautiful and interesting of them. [Most of these have already appeared in the *Report* so only a few are here given.]. *P. filiformis* × *pectinatus*, var. *intermedius*, a new form from Shetland. [This is the *P. vaginatus* of previous workers. So far *vaginatus* is unknown for Britain.]. × *P. franconicus*. Kent, Northants, Berks, etc. *P. rutilus*. Bardister, Tingwall, Shetland, also hybrids. *P. panormitanus*. Norfolk, etc. *P. Sturrockii* [which he thinks is *P. obtusifolius* × *panormitanus*]. Stroud. *P. alpinus* × *gramineus* = *P. nericeus*. River Don, Aberdeen. *P. gramineus* × *natans* = *P. sparganiifolius* Laest. Maam, Galway. [This is the *P. Kirkii* of the *List*.]. *P. gramineus* × *lucens* × *natans* = *P. crassifolius* Fryer. Engine Drive, Camb. Indeed a very beautiful list of which few botanists have the match. Now I hope you will return from Shetland with a rich harvest of Pondweeds, the most interesting of which no doubt will be *rutilus* and its hybrid with *panormitanus*. Your reprints, for which I thank you heartily, I have read with much pleasure. J. O. HAGSTROM." He was especially interested in the Glen Cahir, Clare, "*P. lanceolatus*" which had been named var. *hibernicus*. Hagström thought it was a hybrid of *coloratus* but that plant was then unknown from the Cahir stream. In September 1921, with Mrs Wedgwood, the stream was explored and we succeeded in finding *coloratus*, although small plants, in some plenty with the hybrid, thus corroborating his brilliant suggestion. The sight of it cheered him on his bed of sickness, as did that of the Shetland *P. polygonifolius*, var. *cancellatus*, which after much difficulty I found and thus proved to him it was not a hybrid but a form of that species. Of the Clare Pondweed he says—" This hybrid which I, ad. int., name *P. perpygmaeus* is undoubtedly the most interesting plant which Ireland owns. The same occurs in Burwell Fen, Camb. I will write a note on it in my new book on the Pondweeds." This was written shortly before he died and was probably his last scientific work. As Mr Bennett (himself an acknowledged authority on the genus) generously says, there is no one to take his place. We all deplore the loss of one of our most respected Honorary Members.

HANCOCK, WILLIAM, F.L.S. Born at Lurgan in 1847; died at Bristol, 1914. He was educated at Lancaster and Queen's College, Belfast. He went out to China as a member of Sir Robert Hunt's Imperial Maritime Customs. There he began collecting plants, assisted by Hance, Canton Maximowicz. of St Petersburg. He became a valued correspondent of Sir Joseph Hooker. On several occasions I had the pleasure of meeting him, when he told me of his various journeys—for he saved up his ' leaves ' until he could have one long enough to visit Central America, the West Indies, as well as Java, Sumatra, and Japan. His Herbarium of about 10,000 specimens was given to Kew by his sister. See Kew Bull. 204, 1922.

HARCOURT, The Right Hon. Viscount LEWIS VERNON, Baron Nuneham, P.C., D.C.L. Born January 31, 1863; died February 24, 1922. He was a son of the late Sir William Vernon Harcourt, and Trustee of the Wallace, British Museum, London Museum, and National Portrait Gallery. Educated at Eton, he acted as Secretary to his father, and entered the House of Commons for the Rossendale Division of Lancashire, which he represented for thirteen years. He was Commissioner of Works and a most efficient Colonial Secretary. Although an able parliamentarian and a successful head of each Government Department to which he was appointed, as he often said " he was a politician by accident, a gardener by inclination," but the statement, one felt, had to be taken with a grain of salt, for had his health been robust there is little doubt that one of the highest, if not the highest, political post might in time have come to him. The late Lord Spencer once told the House of Commons "that he was not an agricultural labourer," a statement which, coming from such an extremely well-dressed and so aristocratic a young man, sent the members into shrieks of laughter. So too one could scarcely picture such a magnificently arrayed personage as Lord Harcourt as being one who delved; indeed his tall, graceful, well-groomed figure suggested one of the haute noblesse coming from the Boulevard St Germain rather than out of a potting shed, for he inherited some of the physical as well as the mental traits of his ancient lineage. But he loved his garden and knew much about its occupants. It has been my lot to know four owners of Nuneham. It is, or was, a large plain house beautifully situate on the east bank of the Thames. From this high, wooded bank, where Otho Nicholson's Conduit, which once was erected at Carfax, Oxford, stands, a charming view of the spires and towers of that city is obtained. There is a large deer-park and old-fashioned gardens partly laid out by Capability Brown and partly by the poet, Mason. I made the acquaintance of Colonel Harcourt in the eighties when I was preparing the *Flora of Oxfordshire*, for there was a rumour that when Jean Jacques Rousseau, who was on intimate terms with the Lord Chancellor, Earl Harcourt, came to Nuneham he introduced many French flowers into the woods. Of this we failed to obtain any confirmation. However, I was shown Rousseau's copy of Tasso and some papers which were given by his widow to Earl Harcourt. Colonel Harcourt was succeeded by Aubrey Harcourt, of whom it was rumoured that he was in love with one of the Miss Liddells, a daughter of the Dean of Christ Church, and that her untimely death altered his career. He came to me often as a customer and asked, though he did not always take, my advice on many things relating to himself and even to his private affairs. It was a relief to find that on his death (had he lived a few years longer he would have succeeded to the Earldom of Sheffield) he had left his estates in the family, and that Sir William, once member for Oxford, became the owner of Nuneham. It was one of life's ironies that the estate of Nuneham which came to him who had introduced death-duties, should so soon have to bear them again, for Sir William only lived a short time after his succession. Viscount Harcourt, with his excellent taste, added a parapet to the mansion, thus redeeming its extreme plainness, and by building a stone terrace round the house gave it a dignity befitting its situation. He planted rare creepers on its walls, and covered the stone terraces with Campanulas and rock plants, added a Japanese garden or rather filled a hollow with Japanese trees and made a water-garden, accidentally bringing *Azolla filiculoides* which became a pest. Nuneham became a delightful home to visit and it was always a privilege to go through the grounds with one who really was a flower lover, and had the means and taste to display them without overburdening the scene. I met him for the last time at a Committee at the Speaker's House and he took me in his motor to see Hertford House and to hear an excellent lecture—one of a series he had so wisely initiated—on the furniture of Louis Quinze and Quatorze which in that collection is so splendidly represented. Then all too soon the burying-ground of Nuneham had to receive the remains of its distinguished owner. One instinctively hoped, as one stood by the open grave, that the young boy, so like his father in appearance, might inherit not only his father's genius and kindly courtesy, but might be blessed with health and strength to carry out the duties which lie before him with the same geniality and kindliness.

KIRK, Sir JOHN, G.C.M.G., K.C.B., LL.D., D.C.L., F.R.S. Born at Barry, Forfar, December 19, 1832; died January 15, 1922. Educated at Edinburgh University, which he joined before he was 15, he graduated in 1854 as M.D. He went to the Crimea where he was an assistant surgeon, and in 1857 accompanied Livingstone on the Zambesi mission. He returned in 1863. In 1867 he went as surgeon to the political agency in Zanzibar where, in 1873, he became Agent and Consul. Since 1887 he had been pensioned but was employed on several missions. Until 1911 he was foreign Secretary to the Royal Geographical Society. He contributed many papers to the Linnean Society (see *Proc.* 47, 1922). See also *Kew Bulletin*, no. 2, pp. 49-63.

LINDLEY, Baron NATHANIEL LINDLEY, P.C., F.R.S., D.C.L., etc. Born at Acton Green, the son of the eminent botanist, John Lindley, in 1828; died at East Carleton, Norfolk, December 9, 1921. Lord Lindley was an intimate friend of Sir William and Sir Joseph

Hooker and Bentham and kept up his liking for botany throughout his distinguished career. He inherited his father's rights in the *Gardeners' Chronicle* and took great interest in that deservedly popular publication.

MACKENZIE, OSGOOD H., of Poolewe, Ross-shire. Born, 1842; died at Inverewe, April 15, 1922. He published *A Hundred Years in the Highlands*, which contained many references to Ross-shire plants. His beautiful garden contained many unexpected species until the influence of the Gulf Stream was remembered and the necessarily mild, humid atmosphere.

MONTGOMREY, ARCHIBALD SIM. Born 1844; died April 12, 1922. Mr Montgomrey was a member of a family who have resided in Brentford for over a century, and was well-known and respected for many years as the head of the firm of Montgomrey & Sons, timber merchants, at what is still known as Montgomrey's Wharf, High Street. He married a daughter of Mr John Coward, a minor Canon of St Paul's Cathedral, who died in early life in 1882. Mr Montgomrey was an ardent supporter of many movements in Brentford, and may be regarded as the founder of the Public Library which was first placed at Clifden House. He was one of the first elected members on the Middlesex County Council for Brentford, and served on that body for some years. In 1889 he was appointed to the Commission of the Peace for Middlesex, and later was for several years Deputy-Chairman of the Bench, finally succeeding to the chair. He retired in 1909 when he came to live in Cheltenham. Mr Montgomrey was an enthusiastic botanist and knew the British Flora well. He had a herbarium of flowering plants. H. H. KNIGHT.

In this collection the Water Ranunculi were especially well dried. It has been presented by his sister to the Museum Free Library, Cheltenham.

RYLE, Dr REGINALD JOHN. Born in 1854; died at Guy's Hospital, December 4, 1922. He was the son of Bishop Ryle of Liverpool and brother of Bishop Ryle, Dean of Westminster. He was educated at Repton and Trinity College, Oxford, and pursued his medical career at Guy's Hospital, taking his M.R.C.S. in 1883. He was in medical practice for ten years at Barnet, and then went to Brighton. When there he took his Oxford doctorate in Medicine and was made a J.P. for that borough. For some time he had been medical adviser at Bradfield College, and only this year added *Veronica triphylla* to the Berkshire flora, but as a garden weed. By his wife, Catherine, daughter of S. K. Scott, of Brighton, he had ten children. His chief medical work was one on *The Origin of Feeble-Mindedness.* His regretted death took place shortly after he had bought a new house at Pangbourne, where he hoped to do local botanical investigation.

VAUGHAN, Canon JOHN. Born, the second son of the Rev. Matthew Vaughan, once Vicar of Finchingfield, January 22, 1855; died at Winchester, July 10, 1922. He was educated at Felsted School and graduated from Christ College, Cambridge, in 1876. He became Curate of Alton in 1881, Vicar of Portchester in 1890, of Landridge in 1897, and Rector of Droxford in 1900. He was a graceful writer and a valued contributor to the *Nineteenth Century, Cornhill, Saturday Review* and the *Times.* His published works include *Winchester Cathedral Close*; *Winchester Cathedral—Its Monuments and Memorials*; *A Mirror of the Soul* and, on the subject specially within our scope, there may be mentioned *The Flowers of Selborne and Other Papers*; *The Music of Wild Flowers*, and to Dent's County Guides papers on the Isle of Wight and the Botany of Hampshire. His *Lighter Studies of a Country Rector*, a title which suggests that of the work of 'A. K. H. B.,' of which it has the same delicacy of touch, treats of many subjects and gives a charming account of the Suffolk coast and of the Aldeburgh Pea, mentioned by Lobelius. Other chapters equally readable are on "Churchyard Trees," "The Suffolk Shore" and "In the Footsteps of John Ray." The latter describes the expedition of that naturalist with Francis Willughby into Wales. There is a useful chapter on the arid subject of Plant Nomenclature which he has robbed of its dryness. In alluding to the uncertainty about plant names which obtained until the days of the great Linneaus, perhaps he gives to him more than his due, but the paper must be helpful to botanical beginners to whom sometimes the classical name is repellent, if not unmeaning. Excellent, too, are the chapters on the Isle of Wight, an area which he deeply loved. In the *Cornhill* for June, 1916, Canon Vaughan wrote an elegant and appreciative essay on John

Goodyer of Maple Durham, which gave the salient features of that long overlooked but very excellent Hampshire botanist to whom Johnson owed so much in preparing his edition of Gerard's *Herbal*. This again directed my attention to Goodyer, for in preparing the *Flora of Berkshire*, I found that his library was in the Magdalen College Library. Therefore in these pages (*Rep. B.E.C.* 523-550, 1916) I gave an account of his botanical discoveries, his work at the British flora, as well as a list of the books which he bequeathed to Magdalen College Library. Of this Supplement to our *Report* no adequate acknowledgment has been made in a recent work on the subject. Canon Vaughan had a great love for British Botany. He prepared a neat herbarium, mainly of plants collected by himself, and he knew Hampshire and the Isle of Wight intimately. Personally he was a man of great charm. Interested in his subject he could make others also keen, and he instilled into many young Wintonians a love for plant study. He was also a pleasing and successful lecturer. My first introduction to him was when I was on one of many visits to Mill House (close to the picturesque Hospital of St Cross), then the home of the member for the City, Major the Hon. Guy Baring. From this time a friendship grew up which lasted till the end. He took us to the Cathedral Library to show the copy of Leonard Fuchs' *Historia* which formed the subject of one of his notes, and under his guidance, and what better one could have been found, we saw the new window to the memory of Izaak Walton, with its view of Dovedale and the Itchen, and its fisher Saints and then we paid our reverence to the Chantries of Waynflete, William of Wykeham, and Fox, the founders respectively of Magdalen, New and Corpus Christi Colleges, Oxford. He also showed me where *Aceras* grew in a spot which owing to the necessities of the great war now knows it no more. Nor is that the only loss from that cause which one feels whenever one revisits that city of ancient memories. I see a photograph taken in those happy days by my kind host of a group on the lawn when, of the three boys sitting at our feet, two, the handsome Lord Weymouth, with all his mother's beauty, who was killed ere life's summer had begun, and young Fellowes, whom I had known as a small boy playing Red Indians in the glades of Wychwood. And I have been privileged to see the letter written to his parents just before he went into battle, with all consciousness of his doom and yet with all that gallant bravery—the characteristic of his race. Surely he reached heaven's gate through the portals of fiery pain. And that bravery, too, was the guerdon of his, the taker of the picture, who was shot at Mons as he led the Coldstreams into action as their Colonel, and whose courage was extolled to me in a railway carriage by a private soldier, who little knew he was talking to one who had been his friend. The sorrow of missing these is compensated in some measure by the pride one has in knowing how they died. Last year I saw Canon Vaughan in his beautiful home with its spacious garden thronged with flowers which he knew and loved, close to that stately Cathedral to which he belonged and to which he gave the devotion which was its meed. At that time he had developed a weak heart and was ordered to go slowly. This meant relinquishing his lectures, a great blow, since for many years he had been a most popular lecturer to the Church Reading Union. But, as I told him, he retained the use of his pen which would reach still larger circles, and to this enforced leisure are due some of those beautiful contributions which were a conspicuous feature in the *Times*. This summer I missed seeing him, for when he and Sir Rickman Godlee, a nephew of Lord Lister, with whom he had been staying, and who had showed him that great rarity, the Monkey Orchid, called on me I was away in Holland. On July 9 after he had been preaching in the Cathedral on the centenary of Richard Martin, and was proceeding to administer the Holy Communion heart-failure came on and shortly after his removal to his home he passed peacefully away. He leaves behind a fragrant memory of a gifted and urbane scholar and a gentle and kindly soul which will not readily fade from the minds of those who had the privilege of his acquaintanceship. He was married to the daughter of the Rev. F. Whyley, Vicar of Alton, who, with two daughters, survives him.

A correspondent writes:—"The sudden death of Canon Vaughan has left the Church, and especially the Diocese of Winchester, the poorer for the loss of a devoted minister. and has deprived science of one of her most enthusiastic adherents. Of Canon Vaughan's work as a Churchman it is no place here to speak: suffice it to say that, after taking his degree at Cambridge he passed the whole of his ministerial career in the same diocese, from his first curacy at Portchester, through many years as Rector of Droxford till its culmination in a Canonry at Winchester, to which he was, in 1910, appointed in well-deserved recognition of his long and faithful service by Bishop Ryle. His scientific interests were two-fold, a mingling of the claims of archaeology and of botany which resulted in many charming articles. In particular the writer calls to mind several which he afterwards collected into two volumes entitled *The Wild Flowers of Selborne* and *The Lighter Studies of a Country Rector*. In these two books Canon Vaughan is seen at his best: his delicate touch and graceful style were combined with the keenest observation, yet neither gift was allowed to mar the other. Every essay, therefore, was in itself a perfect piece of work, delightful alike to the reader of literary tastes as to the driest of specialists, whether it dealt with the flowers growing on the walls of Winchester Cathedral, the use of pot-herbs and simples in olden times, the flora of his own country or the habits of birds. Although his interests undoubtedly lay primarily in the ways of nature, it was equally proper for him to pass backwards from the habits of birds and flowers to the lives and occupations of the early British naturalists, Gilbert White, George Crabbe, and many another, and through them to archaeology. But other strains in Canon Vaughan's character also led to the same end. His profound sympathy with his own contemporaries and his intense local patriotism alike guided him along the same path. To this spirit were due papers on a former Countess of Warwick, on Izaak Walton, on the French prisoners of Porchester, the old documents of his parish, and a long-forgotten burial ground. This side of his character attained its fullest realisation when he came to reside in the Close, in a historic house to which was attached a beautiful garden with a stream running through it. Here, in his study, overlooking his flowers, he composed much of his best work, notably a series of articles on birds and flowers for which the writer used eagerly to scan the columns of the *Times* and which only the author's inimitable style betrayed, since all were unsigned, and a series of papers which were later published in *Winchester Cathedral Close* and *Winchester Cathedral*. The latter work is replete with historical information on the monuments, the treasures, and the byegone worthies of the Cathedral which he loved so well. There, too, his knowledge, not merely theoretical, was of practical use, for it was, the present writer believes, largely due to Canon Vaughan that the disjoined fragments of Bishop Andemar's long-dishonoured monument were once again brought together and restored to their original position. All these pursuits and interests, however, serve but to emphasise the outstanding feature of Canon Vaughan's character, his unfailing sympathy with others and his readiness to help. He was never happier than when so engaged, were it in comforting the afflicted, preaching and lecturing far and wide in the diocese, showing the Cathedral to visitors or initiating those many years younger than himself into the secrets of nature. The writer well remembers a day spent with Canon Vaughan in searching for the "Man Orchid" on the downs in the Isle of Wight, and the joy with which a specimen of this rare plant was brought home in triumph. Not a few scholars of Winchester College, like him, enjoyed on Sundays the delightful hospitality of Canon Vaughan and his family and learned from their host a love of the past as well as of birds and flowers."

WOODRUFFE-PEACOCK, Rev. EDWARD ADRIAN. Born at Bottesford Manor, near Brigg, July 23, 1858; died at Grayingham Rectory, February 3, 1922. Educated under Dr Clyde at the Edinburgh Academy, he entered St John's, Cambridge, and proceeded to Bishop Hatfield's Hall, Durham, where in 1880 he took the L.Th. After filling many curacies, in 1891 he became Vicar of Cadney, and in 1920 Rector of Grayingham. The eldest son of a distinguished antiquarian and student he had no distinct recollection when he began geology and botany. He was bred in the open country round Bottesford Manor where there was a library of 12,000 books. He was taken on his earliest natural history rambles when he was only three years of age. He could distinctly remember when, five years of age, he was taken to West Brumby Common where he saw the Ling and the Cranberry, the last of which has now disappeared. There too he had the first glimpse of the vivid blue of *Gentiana Pneumonanthe.* We once compared notes on early memories. My recollections go back to 1854 when I remember the White Water Lilies of the Ouse and still bear the scar of a scratch I got in gathering *Geranium pratense* in a hedge, to which. 20 years later, I went to gather it again. What fixed itself on his mind on that day was the great viaduct of the then unfinished Central railway and seeing the insect galls on the branches of the Creeping Willow, which his father cut open to show him the larva. Rocks, fossils, shells and Lepidoptera were all collected with great eagerness, his mother encouraging his bent to the full. Birds and fish, too, were not neglected. He was one of the founders of the Lincolnshire Naturalists' Union and one of its chief workers, being President in 1905-6. His herbarium is one of the wonders of the Museum. For many years he had been most actively engaged in studying the field botany of Lincolnshire, and his work from an ecological standpoint is amongst the best of its kind, although on somewhat different lines from that usually followed. He was an extremely close observer and an indefatigable note-taker. He once frightened me by sending me his notes on *Sambucus nigra* and other common plants. They appalled one by their volume and one felt one could not see the wood for the trees. In 1909 he published a *Check-List of Lincolnshire Plants*; an analysis of 500,000 observations. He joined our Society in 1910 and contributed to our *Reports*. See an interesting note on a hybrid *Bidens*, v., 33, and on p. 359, 1912, he has a note on *Sieglingia decumbens*, which shows the painstaking way he dealt with the Lincoln species. He notes that it grows in ten out of the eighteen divisions but always under given conditions. The heath-peat must be limeless. On it he had 106 notes with exact soils. Wild ducks are specially fond of the seeds, and when a duck feeding on it is shot more or less of the seed may be found on its back. Thus it is spread, as also by the circular storms and whirlwinds. There are also vivid papers of his on *Capsella* and *Malva sylvestris*, the latter he thought certainly native in Lincolnshire. He suggested that *Rumex maritimus* and *limosus* are seasonal forms but the evidence he cites is not conclusive. (See *Journ. Bot*. 348, 1911.) He was also a contributor to *Science Gossip*, *The Naturalist*, &c. His voluminous notes have been left to Cambridge University Library, his library, herbarium and specimens to the Lincoln County Museum and Library. He was one of my most valued correspondents. Below is a slightly abridged account of our valued member which appeared in the *Transactions of the Lincolnshire Naturalists' Union* :—

Mr Peacock was a man of many attainments and activities, but he was best known as a capable and experienced field naturalist. He will be greatly missed, particularly by those who are interested in the natural history of Lincolnshire, for he accomplished probably more than any other single worker in the accumulation of facts relating to the distribution of plants and animals in the county in which he was born, and in which he spent the greater part of his life. He was one of the founders of the Lincolnshire Naturalists' Union in 1893; for ten years he was its Organising Secretary; he was its President in 1905-6; during the entire period of its existence he has been its moving spirit, and he was once aptly described by the late Canon William Fowler as its "nursing father." He was an all-round naturalist. Full of enthusiasm himself, he inspired enthusiasm in others, and he was ever ready to help and encourage fellow-workers and junior students. From his youth up he was an indefatigable observer and note-taker—"a humble recorder of trifling everyday facts" is the description he gave of himself in the preface to his *Check-List of Lincolnshire Plants*, published in 1909.

Phanerogamic Botany was his special study, and he devoted the leisure of many years to the compilation of a Flora on ecological lines. Mr A. G. Tansley, F.R.S., of Cambridge, was so much impressed by a perusal of the MS. of this Flora that he offered to bear the expense of its publication. "It carries out," he wrote, "the centre thought of ecology. You go for twenty or thirty years to work the same bit of ground annually to discover its changes. As you are willing to sacrifice any time to get at the facts, you have discovered the obscure laws lying behind them." This offer was a great encouragement to Mr Peacock who, so long as health permitted, was engaged in making a final revision of his MS. for the press.

Mr Peacock was thorough in everything he undertook. In his preaching he always made it his aim to get a series of correlated ideas for every address, and he then endeavoured to give expression to his thoughts in plain, simple, forcible language.

He contributed many articles on natural history topics to scientific journals and to the Press, and he wrote a number of pamphlets on the relations of particular grasses to particular soils. He is survived by a widow and three sons. R. W. Goulding.

NEW COUNTY AND OTHER RECORDS.

ABBREVIATIONS.—*Rep. B.E.C.* = *Report of the Botanical Society and Exchange Club*; *Wats. B.E.C.* = *Report of Watson Botanical Exchange Club*; † = Adventive; * = New County Record (in the case of adventive plants this is only rarely added): ! placed after a plant signifies that the compiler has seen a specimen: ! placed after a locality that the compiler has seen it there; × placed between two scientific names means that the plant is a hybrid; 52, &c., numbers following a county, refer to the Watsonian vice-county in *Topographical Botany*; [ ] enclosing a record mean that confirmatory evidence is needed.

† 1 (3). CLEMATIS VITICELLA L. Bank of Thames, near Hampton Court, Middlesex, 1922, BRITTON. Suggested to have been water-borne from Esher, Surrey. See *Rep. B.E.C.* 7, 1914.

9. ANEMONE NEMOROSA L. Growing, at 1000 ft., with *Ranunculus Ficaria* amid last year's *Molinia* on boggy land (sphagnous) on the open mountain below the Bwlch-y-Clawdd, on Myneydd, WILLIAM MEYRICK. *R. Ficaria* had small, narrow, almost linear petals. WEBB.

†11. A. APENNINA L. Hedgebank by the side of the road through Mr Lloyd Graeme's Park to Danes Dyke, E. Yorks, FLINTOFF.

†16. ADONIS ANNUA L. Colchester, BROWN.

17. MYOSURUS MINIMUS L. Fields in Hayling Island, common, Miss HILLARD & DRUCE.

18. RANUNCULUS FLABELLATUS Desf. Corbière, &c., Jersey, Lady DAVY.

21. R. AURICOMUS L. Fyvie, N. Aberdeen, Rev. F. TURREFF.

23. R. LINGUA L. E. Gloster, RIDDELSDELL.

36. R. FLUITANS Lam. In Burry Pill, Llangenydd, Glamorgan, WEBB.

40. R. HETEROPHYLLUS Web. Mountfield, Sussex, H. L. GREEN.

45. R. LENORMANDI F. Schultz. Carnedd Dafydd, Carnarvon, at 2700 ft., an extension of its known altitude by 700 ft., DRUCE.

46. R. HEDERACEUS L. A robust form at Buxton, Derby, FLINTOFF.

†*68. ACONITUM NAPELLUS L. Walcot, Oxon, in considerable quantity, a relic of the 17th century garden of the Jenkinson's. Showed me by G. HAYNES and Mrs ETHERINGTON.

†71. PÆONIA OFFICINALIS L. Cornbury Park, Oxon, a solitary, probably bird-sown specimen, from Lady Margaret Watmey's garden. Found on Nat. Hist. Soc. Expedition by Miss STONE.

†79. PAPAVER SOMNIFERUM L. Cannock Chase, Staffs, Sir ROGER CURTIS & DRUCE; Bullingdon Quarries, Oxford, DRUCE.

80. P. RHŒAS L., var. CAUDATIFOLIUM (Jord.). Hertford, DRUCE.

82. P. LECOQUI Lam. Great Hallingbury, N. Essex, BROWN.

†90. GLAUCIUM CORNICULATUM Curt., var. PHOENICEUM (Cr.). Hythe Quay, Colchester, BROWN.

†96. HYPECOUM PENDULUM L. With above, Colchester, BROWN.

†*98 (2). CAPNORCHIS CANADENSIS (DC.) mihi. *Dicentra canadensis* Walp. Roadside near Lamplugh Station, Cumberland, TEMPLEMAN.

†99. CAPNOIDES CAVA Moench. Stow Easton, N. Somerset, Miss I. M ROPER.

†100. C. SOLIDA Moench. Walcot, Oxon, Mrs ETHERINGTON & DRUCE.

102. C. CLAVICULATA Druce. Leochel Manse, N. Aberdeen, at 1830 feet, a considerable extension of its altitudinal range, W. WILSON.

107. Fumaria Boraei Jord. Yearning, Northumberland, A. H. Evans.

111. F. officinalis L., var. gracilis Pugsl. Axbridge, N. Somerset, Miss Todd.

†116. Mathiola incana Br. Seedlings. Blackpill, Glamorgan, Webb.

124. Radicula sylvestris Druce. *Dundee, Forfar, 1921, Druce; Radyr, Glamorgan, Smith; Carmarthen, Hamer.

142. Cardamine pratensis L., flore pleno. Common round Bury Gower, Glamorgan, Webb; a double form, with orange sepals and bright lilac petals, Aymestrey, Hereford, Daltry.

†157. Alyssum incanum L. Leckwith, Glamorgan, Smith; Borth, Cardigan, Mrs Debenham; Eriswell, N. Suffolk, Clarke.

162. Draba muralis L. On old wall, in Forest of Dean, Gloucester, Haines.

†185. Sisymbrium orientale L. South Stoke, Oxon, Druce.

†191. S. polyceratum L. Bristol, Mrs Sandwith.

†*200. Conringia orientalis Dum. Drayton, E. Norfolk Clarke.

†*211. Brassica Cheiranthos Vill. Welbeck, Notts, known for 12 years, Goulding.

†224. B. incana Schultz. Hull, Miss M. Cobbe.

†228. Eruca sativa Mill. Hull, Miss M. Cobbe.

232. Bursa pastoris Weber. Under this the following microspecies have been named by Dr Almquist.

*B. gallica (At.) c.n. Narborough, Leicester [Ref. No. B.1], Horwood. See *Rep. B.E.C.* 323, 1915. It was sent as *stenocarpa-lyrata*. Also from Bletchingdon, Oxon, Druce.

*B. TREVIRORUM (At.) c.n. Newport, Isle of Wight, STRATTON, in *Hb. Druce*; Buildwas Abbey, Salop; Lichfield, Staffs; Roade, Northants; Arbroath, Forfar, DRUCE.

*B. GERMANICA (At.) c.n. Newport, Isle of Wight, STRATTON, *l.c.*; South Stoke, Oxon, DRUCE; Narborough, Leicester, as *densifolia*, HORWOOD.

*B. VIMINALIS (At.) c.n. Pan, Isle of Wight, STRATTON, *l.c.*

*B. RHENANA (At.) c.n. Usk, Monmouth, LEY, in *Hb. Druce.*

*B. LAEVIGATA (At.) Druce. Carmarthen, HAMER.

†235. LEPIDIUM GRAMINIFOLIUM L. Barry, Glamorgan, SMITH.

236. L. LATIFOLIUM L. Growing in great profusion, native, on both sides of the Taff, near Cardiff, on tidal-mud, associated with *Aster Tripolium*, *Plantago maritima*, var. *latifolia* Syme, etc. The colony, consisting of thousands of plants, stretches for about a quarter of a mile along the edge of the tidal mud. It is near allotments but it also occurs in profusion higher up the river where there are no allotments and also on the opposite river bank. The occurrence substantiates an old record referred to by Mr Riddelsdell as dating from 1840-50 in Motley's herbarium. The earliest record for Glamorgan is in *Phyt.* 1848. Storrie (*Flora Cardiff*) gives St Donat's as a Glamorgan locality but this needs confirmation. For many years it has been known to exist on a railway bank between Cardiff and Penarth where it has been thought to be alien. The plant was distributed by A. E. WADE. See *Rep. B.E.C.* 214, 1920, Miss E. VACHELL.

†239. L. PERFOLIATUM L. Drayton, E. Norfolk, CLARKE; Cardiff, SMITH.

†240 (2). L. NEGLECTUM Thell. Colchester, BROWN.

†247. L. VIRGINICUM L. Claddagh, Galway, Mrs EVANS; Knaphill, Winchester, Miss TODD; Ware, Herts, A. E. GRAVESON; Drayton. E. Norfolk, CLARKE.

249. THLASPI ARVENSE L. Galway, Mrs EVANS.

250. T. PERFOLIATUM L. Snowhill, unusually common this year; Cutsdean, Worcester, HAINES.

†253. IBERIS UMBELLATA L. Cannock Chase, Staffs, Sir R. CURTIS & DRUCE.

254. TEESDALEA NUDICAULIS Br. A robust form, Hartlebury Forest, Worcester, Miss A. WILKINSON.

264. CRAMBE MARITIMA L. In some plenty, shore north of Parton, Cumberland, TEMPLEMAN.

†268. RAPISTRUM RUGOSUM All. Tanneries, Hull, Miss M. COBBE.

†281. RESEDA ALBA L. Radyr, Glamorgan, sometimes with six sepals, SMITH.

†282. R. PHYTEUMA L. Cardiff, SMITH.

284. R. LUTEA L. (as var. LECOQUI). Railway, Brislington, N. Somerset, Miss I. M. ROPER. Det. A. THELLUNG.

293. VIOLA SILVESTRIS Kit., var. PUNCTATA Druce. Headley Wood, E. Sussex, RICHARDS; Whittlebury Forest, Northants; Whaddon, Bucks, DRUCE.

294. V. RIVINIANA Reichb., var. DIVERSA Greg. Carnedd Dafydd, Carnarvon, DRUCE. Mrs Gregory now refers the *V. rupestris* of Mr J. E. Little (*Rep. B.E.C.* 374, 1921) from Langley, Herts, to *V. Riviniana* × *rupestris*.

297. V. LACTEA Sm., var. PUMILIFORMIS. Llanishen, Glamorgan, with V. LACTEA × RIVINIANA, RICHARDS.

299. V. HIRTA L., var. FOUDRASII R. & F. Speeton, between Brislington and Filey, E. Yorks, FLINTOFF. Forma ALBA. Headley Heath, Surrey, RICHARDS. Var. PROPERA (Jord.). Headley Wood, Surrey, RICHARDS. Var. OENOCHROA Gillot. Headley Heath. Sur-

rey, RICHARDS. Var. INCONCINNA J. Briq. Chandler's Cross, Herts, RICHARDS. × ODORATA. Chandler's Cross, Herts, RICHARDS (COLLINA); Bottom Wood, Madehurst, W. Sussex, Mrs WEDGWOOD.

310. POLYGALA DUBIUM Bellynck. Wallasey, Cheshire, C. BAILEY.

325. TUNICA PROLIFERA Scop. Still at Hythe, Kent, Miss MURRAY.

†327. GYPSOPHILA PORRIGENS Boiss. Abbey Wood, W. Kent, POORE & ST J. MARRIOTT.

†328. G. PANICULATA L. Bullingdon, Oxon, DRUCE.

†341. SILENE DICHOTOMA Ehrh. Gloster Docks, GAMBIER-PARRY; Louth, Lincoln, LANDON; Aintree, Lancs, WHELDON; Glasgow, GRIERSON.

343. S. ANGLICA L. Pembrey, Carmarthen, HAMER; in plenty between Kennetston and Druids Stone, Glamorgan, WEBB.

†344. S. QUINQUEVULNERA L. Near Edenbridge, Kent, TALBOT.

360. LYCHNIS DIOICA L. × ALBA. Every intermediate, with both parents, Berwick Bridge, Northumberland, A. H. EVANS.

362. L. ALPINA L. With white flowers at Hobcarten, Cumberland, TEMPLEMAN.

370. CERASTIUM VULGATUM L., var. ALPINUM Grenier. On the Slioch, W. Ross, Miss CATOR & G. TALBOT. Exceptionally large flowers suggesting a cross with *alpinum*, but Mr Talbot tells me he did not see *alpinum* on the mountain.

*372. C. PUMILUM Curt. On a dry bank, Colwyn Bay, Denbigh, in the lane that passes Pwllycrochan Woods, May 1909, DALTRY. This is the earliest Welsh record.

*380. STELLARIA NEGLECTA Weihe, var. UMBROSA (O. & R.). Marshfield, Monmouth, WADE.

381. S. HOLOSTEA L. A form with unnotched petals noticed for years at Birdlip, Gloster, HAINES. Near Bysouth Farm, Penrice, Glamorgan, WEBB.

392. ARENARIA LEPTOCLADOS Guss. Lamplugh, Cumberland, TEMPLEMAN.

†418. CLAYTONIA SIBIRICA L. Lower Eskdale, PICKARD; Branthwaite, Cumberland, with pink, and Gilgarrow, Cumberland, with white flowers, TEMPLEMAN.

424. ELATINE HEXANDRA DC., var. SESSILIS Druce. Worplesdon Common, Surrey, BIDDISCOMBE.

425. HYPERICUM ANDROSAEMUM L. Great Bedwyn, Wilts, HURST.

†443. ALTHAEA HIRSUTA L. In great quantity near Headington, Oxon, in a fallow field, bordering woodland, discovered in June 1922 by F. J. WALL, and in August by T. GAMBIER-PARRY. It continued in flower till November. Its occurrence is probably due to pig corn or pheasant food. It was not there in 1910.

448. LAVATERA PUNCTATA All. Between Truro and Malpas, Cornwall, Miss TODD.

451. MALVA MOSCHATA L., var. INTEGRIFOLIA L. & C. Near Dunsford, about 7 miles from Exeter, Miss TODD. Det. A. THELLUNG. It is less extreme than my Berkshire plant. Mr E. G. Baker says it matches " the Alcea folio rotundo laciniato C.B.P." in *Herb. Brit. Mus.* Var. ALBA. Near Bridge-of-Allan, Stirling, Miss G. A. YOUNG. There probably of hortal origin.

459. SIDA CORDIFOLIA L. Oil works, Hull. Miss M. COBBE.

461. HIBISCUS TRIONUM L. Herb. Cardiff, from the Docks.

474. GERANIUM SANGUINEUM L., var. LANCASTRIENSE (Mill.). A pale-flowered, prostrate plant which was found by Mr TEMPLEMAN at Seascale, Cumberland, is very closely allied to, if not identical with, this.

†479. G. PHAEUM L. Quite naturalised nine miles east of Carmarthen with no houses near, HAMER.

479 (2). G. ENDRESSI Gay. Quite naturalised near Patshull, Staffs, where it has been known for some years, Countess DARTMOUTH & DRUCE; near Tenby, Pembroke, ARNETT.

481. G. PYRENAICUM Burm. f. A procumbent form near Bristol, MAHOOD.

484. G. MOLLE L., var. AEQUALE Bab. Tiverton, Devon, MAHOOD.

494. ERODIUM MOSCHATUM Ait. Bishopston Valley, Glamorgan, WEBB.

497. E. NEGLECTUM Bak. & Salmon. Wallasey sand-dunes, Cheshire, 1892; Hightown, S. Lancs, 1918; St Anne's, W. Lancs, WHELDON.

497. E. LEBELII Jord. Broad Sands, S. Devon, 1920, WOLLEY-DOD.

497. E. GLUTINOSUM Dum. Point of Ayre, Isle of Man, 1917, WHELDON.

497. E. PIMPINELLIFOLIUM Sibth. Abbey Wood, W. Kent, ST J. MARRIOTT.

†500. TROPAEOLUM PEREGRINUM L. Glasgow, GRIERSON.

504. OXALIS ACETOSELLA L., var. SUBPURPURASCENS DC. Stanah Gill, Cumberland, TEMPLEMAN.

†506. O. STRICTA L. Garden ground, Langley, Bucks, GWATKIN.

†507. O. CORYMBOSA DC. and 508. O. VIOLACEA L. Hortal. Camden and Clapham, REDGROVE.

†511. IMPATIENS BIFLORA Walt. Tredegar Park, Monmouth, WADE.

†512. I. PARVIFLORA DC. Bridgnorth, Salop, DRUCE.

*539. ULEX NANUS Forst. Plemont, Jersey, 1859, PIQUET. Not seen in Jersey by Lester-Garland.

*547. TRIGONELLA ORNITHOPODIOIDES DC. Sea-wall, Rumney, Monmouth, WADE.

†548. T. FOENUM-GRAECUM L. Hull, Miss A. B. COBBE.

†551. T. MONSPELIACA L. Cardiff Docks.

†*562. MEDICAGO FALCATA L. L'Ancresse, Guernsey, BOLTON KING. †Var. TENUIFOLIOLATA Vuyck. Sleaford, Lincoln, LANDON; Thetford, Norfolk, Lady D. FITZROY; Dumbarton Oil-works, GRIERSON.

†569. M. SOLEIROLII Duby, teste Thellung. Leith, Midlothian, FRASER.

†575. M. MUREX Willd., var. ACULEATA Urb., teste Thellung. Glasgow, GRIERSON.

†579. M. HISPIDA DC., var. PENTACYCLA DC., teste Thellung. Leith, FRASER. †Var. CONFINIS Burnat. Dry Sandford, Berks, GAMBIER-PARRY.

†581. M. MINIMA Desr., var. RECTA Burnat, teste Thellung. Meanwood, Leeds, DRUCE.

†582. M. LACINIATA Mill. Hull, Miss M. COBBE. Var. BREVISPINA Reut. Colchester, BROWN.

†584. M. CILIARIS All. Cardiff Docks.

586. M. LUPULINA L., var. WILLDENOWIANA Koch. Hull, Miss M. COBBE.

†590. MELILOTUS MESSANENSIS All. Cardiff Docks.

†592. M. SULCATA Desv. Radyr, Glamorgan, SMITH.

†605. TRIFOLIUM LAPPACEUM L. Cardiff Docks.

†606. T. ANGUSTIFOLIUM L. Radyr, Glamorgan, SMITH.

†610. T. STELLATUM L. Penarth, Glamorgan, THOMAS. Seeds of this, we hear, have recently been sown on shingle at Camber, Sussex.

†622. T. RESUPINATUM L. Riddings, Coatbridge, Lanark, GRIERSON.

628. T. REPENS L., var. PHYLLANTHUM Ser. Cardiff Docks.

†630. T. NIGRESCENS Viv. Radyr, Glamorgan, SMITH.

632. T. GLOMERATUM L. With above. ? adventive, SMITH.

641. ANTHYLLIS VULNERARIA L., var. BICOLOR Druce. Exmouth, Devon, A. H. EVANS.

†644. LOTUS TETRAGONOLOBUS L. Cardiff Docks.

†651. GALEGA OFFICINALIS L. Barry, Glamorgan, SMITH; Penarth, Glamorgan, *Hb. Cardiff*.

†665. SCORPIURUS SUBVILLOSA L. Radyr, Glamorgan, SMITH; Cardiff, Glamorgan, WADE.

†666. CORONILLA VARIA L. Near Aberdovey, Cardigan, Mrs DEBENHAM; Aigburth, Lancs, BAILEY.

669. ORNITHOPUS PERPUSILLUS L. Gatehouse of Fleet, Kirkcudbright, Lady ELPHINSTONE; Patshull, Staffs, Lady JOAN LEGGE.

†672. HIPPOCREPIS UNISILIQUOSA L. Radyr, Glamorgan, SMITH.

†*673. ONOBRYCHIS VICIIFOLIUS Scop. Carmarthen, HAMER; Barry, Glamorgan, SMITH.

*680. VICIA OROBUS DC. Pontypool, Monmouth, A. M'KENZIE.

†681. V. VILLOSA Roth. Radyr, Glamorgan, SMITH.

†683. V. DASYCARPA Ten. Acton, Middlesex, Mrs WEDGWOOD. To this also Dr Thellung refers the Barry, Glamorgan, specimen sent to the Club in 1920 by the Dept. of Botany, N.H. Mus. Wales, as *V. Cracca*, f. This was also the view of Mr Wheldon.

688. V. SEPIUM L., var. OCHROLEUCA Bast. Wymondham gravel-pit, Norfolk, Mrs POMEROY.

691. V. LUTEA L. Near Corbière, Jersey, 1922, Lady DAVY. This is a new station in the island, one in which the plant is assuredly native. Mr Lester Garland was suspicious of its indigenity at Mont Orgeuil.

†711. LATHYRUS TUBEROSUS L. Near Cirencester, Gloster, Lady DOUIE.

†727. L. ODORATUS L. Near Aldbourne, Sussex. Miss Trower told me of this years ago. It is naturalised in a hedge bordering a ploughed field and has been known for over 50 years. In 1922 the Countess Buxton took me to the place but the flowers had then mostly been picked. Its sequence in the *Plant List*, following Nyman, should be 708.

731. PISUM ARVENSE L. Pond side, Naworth, Cumberland, Countess CARLISLE & Miss BODLEY.

*763. RUBUS CARPINIFOLIUS W. & N. Middlewick, N. Essex, BROWN.

769. R. BAKERI Lees. Bar Hill Wood, Madeley, Staffs, DALTRY.

*778. R. SELMERI Lindeb. Layer-de-la-Haye, N. Essex, BROWN.

779. R. CALVATUS Blox. Great Bromley; Dedham Heath, N. Essex, BROWN.

787. R. PUBESCENS Weihe, var. SUBINERMIS Rogers. Leavenheath, W. Suffolk, BROWN.

798. R. HIRTIFOLIUS P.J.M. & W., var. DANICUS (Focke). Madeley, Staffs, DALTRY. Var. MOLLISSIMUS (Rogers). Old Manor Lane, Madeley, Staffs, DALTRY.

805. R. CRINIGER Linton. Galley Wood Common, S. Essex, Mrs WEDGWOOD & BROWN.

811. R. GELERTII Frid. Dedham Heath; Little Bromley, N. Essex, BROWN.

814. R. VESTITIFORMIS Rogers. Elmstead, N. Essex, BROWN.

817. R. FURVICOLOR Focke (MELANOXYLON Rogers). Bar Hill Wood, Madeley, Staffs, DALTRY; *near this, Brodie, Nairn, DRUCE.

*818. R. INFESTUS Weihe, var. VIRGULTORUM (Ley). Shotover, Oxford, DRUCE. Det. H. J. RIDDELSDELL. An interesting extension of the range of this pretty bramble which is distributed this year.

822. R. LEYANUS Rogers. Madeley, Staffs, DALTRY.

830 (2). R. BLOXAMIANUS Colem. Layer-de-la-Haye, N. Essex, BROWN.

832. R. FUSCICORTEX Sudre (PODOPHYLLUS Rogers). Stratford St Mary, E. Suffolk, BROWN; Bar Hill Wood, Madeley, Staffs, DALTRY.

844. R. PALLIDUS W. & N., var. LEPTOPETALUS Rogers. Madeley, Staffs, DALTRY.

850. R. HYSTRIX W. & N. Wivenhoe, N. Essex, BROWN.

852. R. MURRAYI Sudre (ADORNATUS Rogers, non P.J.M.). Tiptree Heath, N. Essex, BROWN.

876. R. CAESIUS L. A pretty ternate-leaved form near Farnham, ? Surrey, BIDDISCOMBE.

An extraordinary Bramble has been found by Major Bates van de Weyer in Hungerford Park, Berks, in which the ripe fruits separate from the receptacle, are dull red, and have the flavour of a Raspberry. It is not a sub-erect species. The stems root at tip, but I can see no evidence in the leaf or stem of *idaeus*. The specimens are, unfortunately, too incomplete to name.

†887. FRAGARIA CHILOENSIS Duchesne. Quite naturalised on railway-bank near Hanslope, Bucks, where it has been for many years, DRUCE; Glais, Glamorgan, WEBB.

†892. POTENTILLA RECTA L. Taplow, Bucks. Miss BARBARA BUCKLER.

†896. P. INTERMEDIA L. Ross, Hereford, Miss ARMITAGE; flour mill yard, Whitehaven, Cumberland, WILLIAMSON.

901. P. REPTANS L., var. MICROPHYLLA Tratt. Holwood Park, Keston, W. Kent, ST J. MARRIOTT.

†906. P. NORVEGICA L. Pewsey Station, Wilts, HURST.

909. ALCHEMILLA ALPESTRIS Schmidt. Sligachan, Skye, DRUCE.

†921. POTERIUM CANADENSE A. Gray. Found by Canon LITTLE and Mr G. HAYNES on a stream-side near Glenloin House, Arrochar, at the head of Loch Long. Canon Little tells me people think it was introduced with ballast.

†*952 (2). ROSA RUGOSA Thunb. Crinnis Sands, E. Cornwall, L. J. MEDLIN, ex E. THURSTON.

966. CRATAEGUS MONOGYNA Jacq., var. (vel forma) TRILOBA Druce. Gt. Hallingbury, N. Essex, BROWN.

†*969 (2). C. AZAROLUS L. In a hedge, Hayling Island, S. Hants, Miss KILLARD.

†972. COTONEASTER MICROPHYLLA Wall. On a cliff at Whitford, Sker, on the north coast of Gower, Glamorgan, quite naturalised and difficult to reach, Hon. Mrs A. LEITH.

†972 (2). C. SIMONSII Baker. Thames side between Kingston Bridge and Hampton Court, Middlesex, BRITTON. "Probably this" —A. THELLUNG.

†973. AMELANCHIER CANADENSIS Med. Hayes Common, W. Kent [Ref. No. 199], BRITTON. Det. A. THELLUNG.

†993. SAXIFRAGA SIBTHORPII Boiss. Near Studland, Dorset, BOYS.

†1011. SEDUM RUPESTRE L. Wall, near Calder Bridge, Cumberland, TEMPLEMAN.

†1012. S. REFLEXUM L. Bridgnorth, and on a rocky cliff near Bilton, Salop, DRUCE.

1024. S. VILLOSUM L. Cushie, N. Aberdeen, WILSON.

1027. DROSERA ANGLICA Huds. Near Borth, Cardigan, Mrs DEBENHAM.

*1038. CALLITRICHE POLYMORPHA Lönnr. Wybunbury, Cheshire, 1908, DALTRY. I think it is correct although the specimens are poor.

†1044. LYTHRUM NEOMANTHUM Link. Dried up pond below Parnham, Beaminster, Dorset, A. W. GRAVESON.

†1045. L. HYSSOPIFOLIA L. Hull, Miss A. B. COBBE.

1046. EPILOBIUM ANGUSTIFOLIUM L., var. BRACHYCARPUM (Leight.). Devon, Miss TODD.

1075. ECBALLIUM ELATERIUM Rich. Near Hitchin Station, Herts. Introduced with drug-cultivation, A. W. GRAVESON.

1080. ERYNGIUM CAMPESTRE L. At the foot of the chalk-down, near Wrotham, Kent, F. DRUCE.

†*1090. BUPLEURUM ROTUNDIFOLIUM L. Cannock Chase, Staffs, Sir R. CURTIS.

†1091. B. LANCIFOLIUM Horn. Cardiff Docks.

†1099. APIUM LEPTOPHYLLUM Muell. Hull, Miss A. B. COBBE.

†1101. AMMI MAJUS L. Lucerne field, Buckland, Herts, A. W. GRAVESON; Tunstall, Suffolk, Rev. W. MASON.

1105. CARUM PETROSELINUM B. & H. Abundant and naturalised at Bridgnorth, Salop, DRUCE.

1113. PIMPINELLA MAJOR Huds. Near Potterne, Wilts, GWATKIN; Southwell, Notts, Rev. W. MASON. Var. DISSECTA Druce. Ripon, Yorks, PICKARD.

1114. P. SAXIFRAGA L., var. POTERIIFOLIA Wallr. Much Wenlock. Salop, DRUCE; Largo, Fife, Lady JOAN LEGGE.

†1128. ANTHRISCUS CEREFOLIUM Hoffm. On rubbish-heap near Forge Valley, Yorks, Miss COBBE.

1147. ANGELICA SYLVESTRIS L., var. DECURRENS Wallr. Needwood, Staffs; Buildwas, Salop, DRUCE.

†1165. CAUCALIS LEPTOPHYLLA L. Bristol, Mrs SANDWITH.

*1194. GALIUM ERECTUM Huds. Corbridge-on-Tyne, Northumberland, R. B. COOKE.

1197. G. ULIGINOSUM L. Patshull, Staffs, DRUCE.

†1211. ASPERULA CILIATA Rochel. Slindon, Sussex, Miss BARBARA BUCKLER.

†1234. SCABIOSA MARITIMA L. Buckland, Herts, A. W. GRAVESON.

1243. SOLIDAGO VIRGAUREA L., var. ACUTIFOLIA Druce. Erne Toog, Stromness, Orkney, JOHNSTON. Var. PLUKENETIANA Druce. Point of Cava. Orkney, JOHNSTON.

†1245 (2). S. SEROTINA Ait. Thursley, Surrey, Mrs WEDGWOOD.

1248. BELLIS PERENNIS L., var. PROLIFERA. Dunrossness, Shetland, Mrs SAXBY. A form with the capitulum consisting of almost pure white ligules, the disc florets very few and not yellow, Pockley, near Helmsley, Yorks, DALTRY.

†1254. ASTER LONGIFOLIUS Lam. Cothill. Berks. DRUCE. Det. A. THELLUNG.

†1255. A. LAEVIGATUS Lam. Uxbridge, Middlesex, Mrs WEDGWOOD. Det. A. THELLUNG.

†1255. A. FLORIBUNDUS Willd. Stromness, Orkney, DRUCE. Det. A. THELLUNG.

1266. FILAGO APICULATA G. E. Sm. Berechurch, N. Essex, DRUCE; near Cookham Dene, Berks, Major BATES VAN DE WEYER.

†1292. AMBROSIA TRIFIDA L. Hull, Miss M. COBBE.

†*1303. HELIANTHUS PETIOLARIS Nutt. Avonmouth Docks, W. Gloster, Miss ROPER.

†1306. GUIZOTIA ABYSSINICA Cass. Cardiff Docks, Miss VACHELL.

†1308. COREOPSIS TINCTORIA L. Avonmouth Docks, W. Gloster, Miss ROPER.

1309. BIDENS CERNUA L., var. RADIATA DC. Hall Bottom, near Gosforth, Cumberland, WILLIAMSON.

†1311 (4). B. FRONDOSA L. Bristol, Mrs SANDWITH. Det. A. THELLUNG.

†1315. HEMIZONIA PUNGENS T. & G. Cardiff Docks.

†1322 (2). TAGETES MINUTUS L. Bradford, Yorks, CRYER.

1353. CHRYSANTHEMUM LEUCANTHEMUM L., var. DISCOIDEUM Druce. Mevagissey, Cornwall, Miss TODD.

†1356. C. MACROPHYLLUM W. & K. Dundee, Forfar, DRUCE and CORSTORPHINE. Det. A. THELLUNG.

†1356 (7). C. MAXIMUM DC. Galleywood Common, S. Essex, Mrs WEDGWOOD & BROWN.

†1356 (9). C. SINENSE Sabine. Giffnock, Renfrewshire, GRIERSON.

†1357. C. CORONARIUM L. Cardiff Docks.

†1358. C. BALSAMITA L. Canton, Cardiff, Glamorgan, SMITH.

1360. Matricaria inodora L., flore pleno. Hull, Miss M. Cobbe; Glasgow, Grierson.

†1362. M. suaveolens Buch., var. occidentalis (Greene). Christchurch, S. Hants, A. W. Graveson.

†1368. Artemisia campestris L. Glasgow, Grierson. "Probably this."—A. Thellung.

†1372. A. pontica L. Hayes, Kent, Mrs Wedgwood. Det. A. Thellung.

†1380. A. biennis Willd. Par, Cornwall; Uxbridge, Middlesex, Lady Davy & Mrs Wedgwood; Hull, Miss M. Cobbe.

†1386. Petasites albus Gærtn. Boynton, E. Yorks, Flintoff.

†1396. Senecio squalidus L. Par, Cornwall, Hon. Mrs R. M'Kenna; Rumney, Monmouth, Wade; Sedbury, W. Gloster, Miss A. B. Cobbe; Cheltenham railway, Knight; Abbey Wood, W. Kent, St J. Marriott & Poore. Var. incisus Guss. Chepstow, Monmouth, Miss A. B. Cobbe.

†1399. S. viscosus L. Stockcross, Berks, Van de Weyer; *Kemble, N. Wilts, Druce.

†1402. S. Cineraria DC. Highcliffe, S. Hants, St J. Marriott. × Jacobaea. Horton Cliff, Gower, Glamorgan, Webb.

1424. Carduus nutans × acanthoides. Lilburn, Northumberland, A. E. Evans.

†1425. C. pycnocephalus L. Radyr, Glamorgan, Smith. Det. A. Thellung.

1433. Cirsium arvense Scop., var. mitis, sub-var. albiflora. Newburgh, Wigan, Lancs, Miss R. Bright. Var. vestitum Koch. Skaill, Orkney, Druce. Var. maritimum (Fries) Druce. Aldeburgh, E. Suffolk, Druce.

†1443. Mariana lactea Hill. Top of Bryn Ewryn, Colwyn Bay, Denbigh, Pickard.

1446. SERRATULA TINCTORIA L., var. ALBA. Near Cardiff, Glamorgan, TEMPLEMAN.

1449. CENTAUREA JACEA L. Hayling Isle, S. Hants, Miss HILLARD; Milverton, Warwick, BROMWICH. Sub-sp. JUNGENS Gugl., var. FIMBRIATISQUAMA Gugl. West Malling, W. Kent, WOLLEY-DOD; Askham Lade, L. Lancs, 1915, LUMB.

1451. C. NIGRA L. Mr C. E. Britton has named the following:

C. NEMORALIS Jord. N. Warnborough, N. Hants, Miss PALMER, in *Hb. Druce*; Hungerford, Berks and Wilts; Charlbury and Yarnton [Ref. No. 954], Oxon; Twinstead [Ref. No. Z 1011], N. Essex; Denshanger, Northants; Buckingham; Cannock Chase, Staffs, DRUCE; Rushock, Worcester, Miss WILKINSON. Forma RADIATA Britton. Wolvercote, Oxon; Cumnor, Berks; Hertford, DRUCE. Var. SUBINTEGRA Britton. Tayside, Perth; Rescobie, Forfar, DRUCE. Forma RADIATA Britton. Princes Risborough, Bucks [Ref. No. Z 1056], DRUCE.

C. DRUCEI Britton. Maplestead, N. Essex. * A plant from Princes Risborough, Bucks, probably belongs to forma RADIATA, DRUCE.

*1451. C. SURREJANA Britton. Muswell Hill, Middlesex; Bridgnorth, Salop, DRUCE.

†1463. C. MELITENSIS L. Claddagh, Galway, Mrs EVANS.

†1465. C. CALCITRAPA L. Barry, Glamorgan, SMITH.

†1468. C. ASPERA L. Barry, Glamorgan, SMITH.

†1476. CARTHAMUS LANATUS L. Cardiff, Miss VACHELL; Glasgow, GRIERSON.

†1477. C. TINCTORIUS L., var. INERMIS. Glasgow, GRIERSON.

1480. CICHORIUM INTYBUS L. In a field near Kilmallie Church, Westerness, WEBB.

†1492. CREPIS MOLLIS Asch. Swaythling, S. Hants, RAYNER. A very unexpected adventive; probably a fodder introduction.

1493. C. PALUDOSA Moench. Markland Grips, Notts, GOULDING.

1494. C. NICAEENSIS Balb. The record, " Shalford, S. Hants, Miss Todd," is misplaced. The plant from Shedfield, Hants, belongs to *C. biennis* L.

1502. C. TARAXACIFOLIA Thuill. Patshull, Salop, DRUCE.

†1512. HIERACIUM AURANTIACUM L. St Peter's Port, Guernsey, 1854, PIQUET; Hirsel Woods, Roxburgh, *Hb. Druce*.

†1512 (2). H. BRUNNEO-CROCEUM Pugsl. Mawgan, Cornwall, 1903, LOYDELL; Calbone, Somerset, 1867, HAYNE; Patshull, Staffs, Lady J. LEGGE'S SCOUTS; Formby, Lancs, WHELDON (Linton says of this "*aurantiacum*, not easily mistaken "! (see *Rep. B.E.C.* 262, 1912); Kyle of Loch Alsh, W. Ross; Coggs Witney, Oxon; Much Wenlock, Salop, DRUCE.

1528. H. MARSHALLI Linton. A plant, nearest to this, on Ben Udlaidh, opposite Ben Laoigh, at 2000 ft., Lady EDINA AINSWORTH.

1542. H. RUBICUNDUM F. J. H., var. BOSWELLII W. R. L. Betty Hill, W. Sutherland, DRUCE; Grange-over-Sands, W. Lancs, Miss M. COBBE.

1550. H. BRITANNICUM F. J. H. Aysgarth Falls, N.-W. Yorks, Miss M. COBBE.

1572. H. SERRATIFRONS Almq., var. TORTICEPS (Dahlst.). Symond's Yat, W. Gloster, REDGROVE.

1573. H. PICTORUM Lint. Mr Pugsley says of some specimens from the Hill of Hoy, Orkney, 1920, " cf. *Pictorum*," DRUCE.

1609. H. SCIAPHILUM Uechtr. Lichfield, Staffs, DRUCE. Var. TRANSIENS. Hawes, N.-W. Yorks. Var. GRANDIDENS. Gayle Beck, N.-W. Yorks, Miss M. COBBE.

1614. H. DIAPHANOIDES Lindeb. Carnedd Dafydd, Carnarvon, DRUCE.

1637. H. BOREALE Fr., var. DUMOSUM. Southampton, RAYNER.

*1638. H. UMBELLATUM L. Creg Meish, Isle of Man, ex Rev. J. TALBOT, WHELDON.

[1642. LEONTODON HISPIDUS L. On the Slioch, W. Ross, Miss CATOR & G. TALBOT. Needs confirmation. I hesitate to include it in the W. Ross list till I see a specimen.]

1648. LACTUCA VIROSA L., var. INTEGRIFOLIA S. F. Gray. Dartford Heath, Kent, REDGROVE.

1649. L. SERRIOLA L. Hythe Quay, Colchester, BROWN; Hertford, A. W. GRAVESON; Harlech, Merioneth, BARTON; Chesterton, Cambridge, MILL & EVANS.

1650. L. SALIGNA L. Barton and Chesterton, Cambridge, MILL, ex EVANS.

1645. TARAXACUM. Herr Dahlstedt has kindly named the following specimens of Dandelions which, for the sake of convenient reference, are here arranged alphabetically. They refer to new county records chiefly.

T. ANGLICUM Dahlst. The Parks and Yarnton, Oxford, 1921; Wytham, Berks.

T. BRACHYGLOSSUM Dahlst. Quenvais, Jersey, 1877; Afton Downs, Isle of Wight; Southall, Middlesex; Great Brickhill, Bucks, 1900; Tubney, Berks, 1909 [Ref. No. 2001]; Stow Wood, Oxon, 1889; Harleston, Northants, DRUCE; Shotover, Oxon, 1824, BLAKE in *Hb. Druce;* Hitchin Cricket Field, Herts, LITTLE; near Leicester; Great Malvern, Worcester, Miss PALMER; North Berwick, Haddington, 1858, BELL; Monifieth Links, Forfar, 1913, CORSTORPHINE; Skye, 1920, DRUCE; Wimbledon, etc., Surrey; Hampton Court, Middlesex, TODD.

T. COPIDOPHYLLUM Dahlst. Bradmore Green, Surrey, TODD.

T. CROCEIFLORUM Dahlst. Botleys, Chertsey, Surrey, TODD.

T. FAEROENSE Dahlst. (*T. spectabile*, var. *maculigerum*, and *T. spectabile*, var. *Girhildae* Beeby). I gathered this in Glen Clova, Forfar, in 1882. See also *Rep. B.E.C.* 566, 1919. It is widely distributed as I have gathered it in Caenlochan, Forfar; Teesdale, Durham, 1909, then thought to be a form of *spectabile*; Glen Shee,

E. Perth, 1889; Ben Dearg, W. Ross, 1902; E. Ross; Braeriach, Easterness; Ben Heasgarnich, M. Perth; cliffs of Twl Dhu, Carnarvon, 1899; Bangor, Carnarvon, 1917, as *rubrinerve*; Spiggie, Bressay, Burga Water, Loch Girlstone (as *Girhildae*) Zetland; Stromness, Orkney, 1920. Yeldersley, Derby, W. R. LINTON, as *udum*; Tongue, Sutherland, MARSHALL, as *udum*.

T. FULVUM Raunk. Addington Park, TODD; Brickhill, Bucks, 1902; Longworth, Berks [Ref. No. X 12]; Oxford [Ref. No. Y 107]; Galashiels, Selkirk, DRUCE.

T. HAMATUM Raunk. A common plant in the home counties. Mr Todd has collected it at Wimbledon, Mitcham, Chertsey, Wickham, and many places in Surrey. I have also seen it at Uxbridge, Bucks; Acton, Southall, etc., Middlesex; Bracknell, Berks; Pyrford, Surrey, 1918; Chalvey, Bucks, 1900; Hoddesdon, Herts.

T. LACISTOPHYLLUM Dahlst., the commonest British representative of the Erythrosperma, is widely distributed. Sheen Addington, and many Surrey localities, TODD; Dartford Heath, St. J. MARRIOTT; St Ouen's and St Helier's, Jersey; Pyrford, Surrey; Swanage, Dorset; Wilstone, Wilts; Littlestone-on-Sea, Kent, 1910, DRUCE; Bracknell, Berks, 1918; Barry Island, Glamorgan, RIDDELSDELL; Carisbrooke, Isle of Wight, Miss PALMER; Brean Down, N. Somerset [Ref. No. 122], BARTON; Southsea Common, Hants, Miss PALMER; Newbottle, Brackley, Northants; Brickhill, and top of Ivinghoe Beacon, Bucks; Aldeburgh, E. Suffolk; Sudbury, Suffolk; Bridgnorth, Salop; Patshull, Staffs; Llandudno, Carnarvon, 1899; Glen, Peebles, DRUCE; Windmill Hill, Hitchin, Herts, LITTLE; Mersea, etc., N. Essex, BROWN; Roundway Downs, N. Wilts [Ref. No. 2838], MARSHALL, as *udum*; Chesterton, Warwick, 1893, BROMWICH, as *udum*; Winchester, on the Down, 1906, JACKSON; near Shirley, Derby, W. R. LINTON, as *corniculatum*; Crosby, Lancs, 1875, LEWIS; Kirkcaldy Links, Fife, BOSWELL SYME.

T. LAETICOLOR Dahlst. Northampton Race Course, April, 1873 (one of the first plants collected by me for an herbarium), DRUCE.

T. LAETUM Dahlst. St Ouen's, Jersey, 1920; Barmouth, Merioneth, DRUCE; Kirkcaldy, Fife, BOSWELL SYME; Seaton Carew, Durham, 1887, E. FOX.

T. LONGISQUAMEUM Dahlst. As a modification, Hailey, Oxford, 1919. Very near *Arrhenii*, DRUCE.

T. PALUSTRE DC., seg. Yarnton, Oxon; Chesham, Bucks; Gort, Galway, 1909; The Park, Oxford, 1921, DRUCE; Ashwell Common, Herts, COLEMAN; Accrington, Lancs, 1852, DUGDALE, not identical with the Swedish form.

T. NORDSTEDTII Dahlst. Wimbledon, Sheen, etc., Surrey, TODD; Shotover, Oxon; Needwood, Staffs, DRUCE; Bridgend, Glamorgan, RIDDELSDELL, named *udum* by Marshall, which like *Euphrasia curta glabrescens* seemed to be a convenient name for any plant off type.

T. SUBLACINIOSUM Dahlst. Brading Harbour. Isle of Wight, Miss PALMER; Shipley, Yorks, CRYER; Lechlade, Gloster; Farringdon, Berks, 1921 [Ref. No. Y75]; as a form, Bicester, Oxon [Ref. No. Y47]; Stow Wood, Oxon [Ref. No. Z80]; the Parks, Oxon [Ref. No. Y30]; Blisworth, Northants [Ref. No. Y38]; Stoney Stratford. Bucks, DRUCE.

T. TENEBRICANS Dahlst. Yarnton, Oxford, DRUCE.

1658. SONCHUS OLERACEUS L., var. CILIATUS (Lam.). Patshull, Staffs; Bridgnorth, Salop; Hanslope, Bucks; Rottingdean, Sussex, DRUCE. Var. TRIANGULARIS Dum. Roade, Northants; Ware. Herts; Westonbirt, Gloster, DRUCE.

1666. JASIONE MONTANA L., var. LATIFOLIA Pugsl. Clovelly, N. Devon; Grève L'Etac, Jersey; Petit Bo, Guernsey; Spiggie, Burrafirth, Shetland, DRUCE; Carrick, Eday, Orkney, JOHNSTON. Var. MARITIMA Reichb., or near it, Lizard Down, Cornwall, DRUCE.

†1674. CAMPANULA RAPUNCULOIDES L. Ouseby, Cumberland, Rev. W. MASON.

†1676. C. PERSICIFOLIA L. Roadside near Pardshaw, Cumberland, TEMPLEMAN.

†1679. LEGOUSIA SPECULUM Fisch. Cowbridge, Glamorgan, Dr VACHELL.

1694. ERICA CINEREA L., var. SPLENDENS. Poole Harbour, Dorset, T. E. BELCHER; Urrisbeg, Galway, DRUCE.

1708. PYROLA MEDIA Sw. *Salop, PHILLIPS, ex BENNETT; Fyvie, Aberdeen, TURREFF.

1709. P. MINOR L. *Lybster, Caithness, LILLIE, ex BENNETT; Fyvie, Aberdeen, TURREFF.

1711. P. SECUNDA L. Edinburgh; FIFE, in *Hb. Edin.*, teste ARTH. BENNETT, in *Trans. Bot. Soc. Edin.*, 75, 1920.

1712. HYPOPITYS MONOTROPA. Hewelsfield, W. Gloster, REDGROVE.

1713. LIMONIUM VULGARE Mill., var. PYRAMIDALE Druce. Near Conway, Carnarvon, *Hb. Druce.*

1721. STATICE PLANIFOLIA Druce. Helvellyn, Cumberland, PICKARD.

*1745. CENTUNCULUS MINIMUS L. Howgill, W. Yorks, A. WILSON.

†1747. SYRINGA VULGARIS L. Hedges near Fairford, E. Gloster, DRUCE.

†1750. VINCA MAJOR L. Bishopston Valley below Great Kjttle, Glamorgan, looking wild, WEBB.

†1751. V. MINOR L. Stogumber, Somerset, March 1922, DRUCE.

1757. CENTAURIUM PULCHELLUM Druce. Hayling Island, S. Hants, Miss HILLARD.

†1777. POLEMONIUM CAERULEUM L. Brick-pits, South Carr, Notts, known for 20 years, GOULDING.

†1778. PHACELIA CILIATA Benth. Romford, Essex, Lady DAVY; Potterne, Wilts, GWATKIN.

†1783. OMPHALODES VERNA Moench. Stowe, Norfolk, J. L. DUDDINGTON & LITTLE.

1785. CYNOGLOSSUM MONTANUM L. Bluntisham, Hunts, Rev. E. PEAKE.

†1789 (2). BENTHAMIA ANGUSTIFOLIA (Lehm.) Druce. Hull, Yorks, Miss M. COBBE.

†1789 (3). B. LYCOPSIOIDES Lindl. Farne Island, Northumberland, Mrs HOWARD PEASE; Drayton, E. Norfolk, CLARKE.

†1789 (6). B. MENZIESII (N. & M.) Druce. Torquay, Devon, VINCENT; Moulsford, Berks, Miss NEILD; near Sleaford, Lincs, Miss LANDON; Brislington, Bristol, Mrs WEDGWOOD; Limpsfield, Surrey, Rev. E. CRUTWELL; Drayton, Middlesex, DRUCE. Botley, Oxon, GAMBIER-PARRY. Det. A. Thellung as probably *Amsinkia Menziesii* Nels. & M'Bride.

†1792. SYMPHYTUM PEREGRINUM Ledeb. Lamplugh, Cumberland, TEMPLEMAN; Bridgnorth, Salop, DRUCE.

†1792 (2). S. ASPERUM Lepech. Port of Menteith, Perth, *Hb. Druce.*

†1802. ANCHUSA AZUREA Mill. Sleaford, Lincs, Miss LANDON; Chipping Norton, Oxon, DRUCE.

1808. PULMONARIA OFFICINALIS L. Completely naturalised in the woodlands of Kingston Lisle Park, Berks, shown me by Major BATES VAN DE WEYER, who has known it there for many years; Hampton Loade, Salop, REYNOLDS; in the wilderness, Walcot, Oxon, HAYNES & DRUCE.

1822. LITHOSPERMUM OFFICINALE L., var. LATIFOLIUM Salm. Clandon Downs, Surrey, MONCKTON.

†1827. ECHIUM PLANTAGINEUM L. Splendid specimens near St Just, E. Cornwall, THURSTON. See *Suppl. Fl. Cornw.* 93, 1922. Gloster Docks, GAMBIER-PARRY.

†1831 (2). VOLVULUS DAHURICUS (Sims) Druce. Bexhill, H. L. GREEN. Det. A. THELLUNG as ? *C. dahuricus* Sims. (*C. sepium*, var. *americanus* Sims ? = var. *roseus* DC. ?)

1833. CONVOLVULUS ARVENSIS L., var. STONESTREETII Druce. Basingstoke, Hants, G. W. WILLIS, ex RAYNER.

†1843 (2). CUSCUTA SUAVEOLENS Ser., teste Kew. At Trenvissick Farn, twining up *Lychnis dioica*, Par, Cornwall, ex THURSTON.

1849. Solanum triflorum Nutt. Cardiff, *Hb. Storrie.*

†1855. Datura inermis Jacq., teste Kew. Mead Lane gravel-pit, Hertford, A. W. Graveson.

†1860. Verbascum Philomoides L. Par, Cornwall, Mrs Wedgwood. Det. A. Thellung.

†1863. V. virgatum Stokes. Hayling Island, S. Hants, Miss Hillard.

†1877. Linaria purpurea Mill. Kingsdown Shingle, Kent, Lady Kathleen Stanley.

1878. L. repens Mill. Matherne, Monmouth. Redgrove; railway bank, Giggleswick, Yorks, Pickard.

†1882 (2). L. arenaria DC. Still spreading at Braunton Burrows, Devon, 1922, Lady Gwendolen Churchill.

1892. Scrophularia alata Gilib. Good specimens near Buildwas, Salop, Druce.

†1898. Mimulus guttatus DC. Cushie, N. Aberdeen, Wilson; in dry places at Cwmllynfell, Glamorgan, Webb.

1899. M. moschatus Dougl. Near Cushie, N. Aberdeen, Wilson.

†1904. Erinus alpinus L. Tutshill, Chepstow, Gloucester, Mrs Wedgwood.

†*1922. Veronica triphyllos L. In a neglected kitchen-garden, Bradfield, Berks, R. J. Ryle.

1933. Euphrasia brevipila Burnat & Gremli. Devil's Bridge, Cardigan, J. S. Wall; Langness Peninsula, Isle of Man, Wheldon; Jedburgh, Roxburgh, Burdon; Kyleakin, Skye, Druce; Stenness, Orkney, Marshall [Ref. No. 2403] as a hybrid of *curta* and *brevipila*, but Lumb sees no trace of *curta* in it.

1934. E. nemorosa Pers., var. ciliata Drabble. Grand Mare, Guernsey, Druce; Woolly Bay, N. Devon, H. E. Fox; Bexhill,

E. Sussex, H. L. Green; Twinstead, N. Essex; Linton, Cambridge; Woburn, Beds; Park Corner, Oxon, Druce; Chesham Bois, Charteridge, Bucks, Britton; Oystermouth, Glamorgan, 1909, Bailey; Pennywilt, etc., Brecon, Barton; Sapey Brook, Hereford, J. E. Wall; Mouzell, Lancs, Pearsall; Fyling Hall, Yorks, J. E. Wall; Bodeilo, Holyhead, etc., Anglesey; Duncansby Head, Caithness, Druce.

1934 (3). E. hirtella Jord. Coffins Well Parish, Devon, Miss Larter, *in litt.*, teste Hiern.

1934 (4). E. confusa Pugsl. Moor of Helmer Tor, E. Cornwall [Ref. No. 41], Rilstone. This Pearsall and Lumb refer to *E. minima* Jacq.

1936 (2). E. septentrionalis D. & L. Bettyhill, Sutherland, Druce; Perranporth, Cornwall, Rilstone, teste Lumb.

1938. E. foulaensis Towns. Coffins Well Parish, Devon, Miss Larter, teste Hiern.

1939. E. micrantha Reichb. Balsall Common, Warwick; Glen, Peebles; Strathpeffer, E. Ross; Den of Durkadale, Black Crag, Orkney, Druce.

1940. E. scottica Wettst. To this Lumb refers Marshall's No. 2398 from Tongue Bay, W. Sutherland, which he records as *curta* × *scottica*. Lumb says there is no evidence of *curta* in it.

1940 (2). E. minima Fr. To this Pearsall and Lumb refer Marshall's No. 4449 from Simon's Bath, Somerset, and No. 4443 from Withypool, S. Somerset.

1941. E. Rostkoviana Hayne, teste Lumb. Tunbridge Wells. Kent. Miss Palmer in *Hb. Druce;* Chesham Bois, Cholesbury, Bucks, Britton; Hyfnant, Cardigan, J. E. Wall; Bervie, Kincardine; Reay, Caithness; Glen Cahir, Clare; Morley Bridge, Co. Kerry, some with very numerous glands, others nearly destitute of clothing, Druce.

1943. E. Kerneri Wettst. Probably the *minima* from Kirkmichael, E. Perth, N. Trethewey; Stubhampton, Dorset, Melvill; Twinstead, N. Essex; Swaffham, W. Norfolk; Hertford; Llanberris, Carnarvon, Druce; *Sanday, Orkney, Johnston in *Trans. Bot. Soc. Edin.* 58, 1921; Forge Valley, E. York, J. E. Wall; Glen Cahir, Co. Clare, Druce.

1952. Rhinanthus Crista-galli L., var. robustus Druce. Carmarthen, Hamer.

1954. R. stenophyllus Schur. S. Stoneham, S. Hants, Rayner; Laugharne, Carmarthen, Hamer.

1966. Orobanche major L. Between Amesbury and Stonehenge, Wilts, Hon. Mrs Ivo Fiennes. It is common in that neighbourhood.

1966 (2). O. reticulata Wallr., var. procera (Koch) Druce. Near East Keswick, Yorks, W. Johnson, jun., ex W. Johnson.

1974. Lathraea Squamaria L. On spruce fir, High Force, Teesdale, Durham, Pickard.

1977. Utricularia intermedia Hayne. Little Arrow Moor, S. of Coniston Old Man, N. Lancs, Templeman.

1977 (2). U. ochroleuca Hartm. Ennerdale, Cumberland, Templeman

1978. U. minor L. Cogra Moss, Lamplugh, Cumberland, Templeman.

1989. Mentha alopecuroides Hull. Little Maplestead, N Essex, Druce; Blakesley, Northants, 1904, Loydell, as *rotundifolia*; *Bishop's Stortford, Herts, A. W. Graveson.

1990. M. villosa Huds. (*M. longifolia* × *spicata* × *rotundifolia*). Near Malvern, Worcester, Wall.

1990. M. longifolia Huds., var. Nicholsoniana Strail. Canton, Cardiff, Glamorgan, 1922, Smith.

1991. M. SPICATA L. Broad Windsor, Dorset; Water Hall Farm, Hertford, A. W. GRAVESON; Patshull, Staffs, DRUCE.

1993. M. PIPERITA L. Following the most eminent students of this group, in the *British Plant List* I prefixed the hybrid signs to the Peppermint, which I believe to have arisen from *M. aquatica* and *M. spicata*. It may have been that a form of *aquatica* more destitute of its characteristic odour was the origin of the original cross. It is quite likely that a monasterial garden may have been the source whence most of the British *Mentha piperita* has been scattered over the country, since as *M. spicata* is not a native Mint, it could not have originated here before that species had been introduced. Perhaps it was during the Roman occupation that it arrived. But as there are many varieties of each of the assumed parents, we might expect a great variation in the Peppermint. Such is not the case—there are a few variations, but the mass of the British *piperita* is singularly uniform as the type the *M. officinalis* Hull. The var. *vulgaris* of Sole is comparatively rare, although a form of this, called the Black Peppermint, is largely cultivated, affording as it does, on distillation, a fragrant brand of essential oil. In addition there are, as Mr Fraser points out, plants rather more hairy than the type. These may be the offspring of a cross in which a more hairy variety of *M. aquatica* is one of the parents, or they may be a secondary hybrid in which *piperita* may have crossed with *aquatica*. Mr J. Fraser has recently examined the sheets of the group in my herbarium. He recognises the var. *vulgaris* from Mount Bay, Cornwall, 1878, CURNOW; Deeping, Northants; Lynmouth, N. Devon; Balsall, Warwick; North Leigh, Oxon. A plant agreeing with the morphological characters of *M. piperita*, but with the odour of *spicata*, was found by Mr C. P. Hurst at Bedwyn Brailes, Wilts, and is distributed this year.

1996. M. VERTICILLATA Huds., var. ACUTIFOLIA (Sm)., with glabrous pedicels. Dalmally, Argyle, DRUCE.

2012. SATUREIA NEPETA Scheele. Barry, Glamorgan, SMITH.

†2023. SALVIA PRATENSIS L. Ickleton, Cambridge, A. SHRUBBS, ex A. J. EVANS.

†2024. S. SYLVESTRIS L. Barry, Glamorgan, SMITH.

†2025. S. NEMOROSA L. Grosmont, N. Yorks, FLINTOFF.

2031. S. VERTICILLATA L. Hayle, Cornwall, Miss TODD; Carnforth, Lancs, MASON.

†2035 (3). NEPETA MUSSINI Spreng. Weston-super-Mare, N. Somerset, SMITH.

2046. PRUNELLA LACINIATA L. Chelsham, Surrey, BEADALE.

†2048. SIDERITIS MONTANA L. Riddings, Lanark, GRIERSON.

2062. GALEOPSIS TETRAHIT L., var. NIGRICANS Bréb. Near Winterham, North Down, W. Kent, ST JOHN MARRIOTT.

†2067. LAMIUM MACULATUM L. Between Southridge Farm and Aldworth, Beds., Rev. J. DE C. LAFFAN.

†2082. TEUCRIUM CHAMAEDRYS L. Fine specimens, Perranuthnoe, Cornwall, E. THURSTON.

†2085. AJUGA GENEVENSIS L. Hayle, with *Anchusa ochroleuca*, etc., Phillack Towans, Cornwall, THURSTON. It is this species, not *pyramidalis*, which occurs there.

†2089. PLANTAGO INDICA L. Cardiff, Glamorgan, Miss VACHELL.

2090. P. CORONOPUS L., var. PYGMAEA Lange. Limestone turf, Tears Point, Rhosilli, Glamorgan, WEBB.

2092. P. LANCEOLATA L., lusus MULTICEPS. Allerton, Lancs, M. A. WILSON. Forma SPHAEROSTACHYA (M. & K.). East Mersea, N. Essex, BROWN.

†2095. P. LAGOPUS L. Bristol, Mrs SANDWITH.

2099. P. MAJOR L., var. BRACHYSTACHYA Wallr. Leigh Woods, N. Somerset, Miss ROPER.

2101. LITTORELLA UNIFLORA Asch. Llanelly, Carmarthen, HAMER; *reservoir, near Rashgar, Co. Dublin, STELFOX.

†2112. AMARANTHUS ALBUS L. Pyrford, Surrey, Lady DAVY; Cirencester, Gloster, GREENWOOD. Det. A. THELLUNG.

†2113. A. DEFLEXUS L. Hastings, Sussex, L. B. HALL. Det. A. THELLUNG.

†2114 (3). A. SILVESTRE Vill. Lindfield, Sussex, Mrs WEDGWOOD.

†2123. CHENOPODIUM OPULIFOLIUM Schrad. Between Truro and Malpas, Cornwall, Miss TODD. Var. MUCRONULATUM G. Beck. Harrow Road, Middlesex, 1869, J. L. WARREN. × ALBUM = C. PREISMANNI Murr. Colchester, Essex, DRUCE. × ALBUM = approaching C. BORBASII. Leckwith, Glamorgan, A. WADE.

2124. C. ALBUM L., var. PEDUNCULARE (Pers.). By the Heronry, Birch, N. Essex, BROWN. Var. PAUCIDENS (Murr). Radyr, Glamorgan, SMITH; Cannock Chase, Staffs, DRUCE & Sir R. CURTIS. Var. SUBFICIFOLIUM (Murr). Cannock Chase, Staffs; Bridgnorth, Salop, DRUCE. Var. VIRIDE (L.). Naworth, Cumberland, Countess CARLISLE. Var. PSEUDO-BORBASII (Murr). Grangetown, Glamorgan, A. WADE. Var. GLOMERULOSUM (Reichb.). Leckwith, Glamorgan, A. WADE; Dedham, N. Essex, BROWN.

†2125. C. LEPTOPHYLLUM Nutt. Colchester, Essex, BROWN; Leith Docks, Midlothian, FRASER; Hull, Yorks, Miss A. B. COBBE; St Anne's-on-Sea, Lancs, BAILEY.

†2130. C. AMBROSIOIDES L., var. SUFFRUTICOSUM (Willd.). Barry, Glamorgan, SMITH.

†2131 (2). C. STRIATUM Kras. Barry, Glamorgan, SMITH; Hull, Yorks, Miss M. COBBE.

†2131 (3). C. HIRCINUM Schrad. Hull, Yorks, Miss M. COBBE; Leith, Midlothian, FRASER.

†2131 (4). C. BERLANDIERI Moq. By the sea-shore, Walton-on-the Naze, Essex, BROWN.

†2131 (7). C. CARINATUM Br. Bradford, Yorks, CRYER.

†2135. ROUBIEVA MULTIFIDA Moq. Swaythling, S. Hants, RAYNER.

†2135 (5). MONOLEPIS NUTTALLIANA (R. Sch.) Greene, var. MINOR (Moq.) Thell. (*M. trifida* Schrad.). Glasgow, GRIERSON. Det. A. THELLUNG.

†2139. SPINACIA OLERACEA L. Hayle, Cornwall, THURSTON.

†2145. ATRIPLEX TATARICA L. Hambledon Bridge, S. Hants, Mrs WEDGWOOD; Cardiff, Miss VACHELL; Hull, Miss M. COBBE.

†*2151 (2). A. SPONGIOSA F. & M. Ware, Herts, A. W. GRAVESON.

2153 (10). AXYRIS AMARANTOIDES L. Hull tanneries, Yorks, Miss A. B. COBBE.

2166. DONDIA MARITIMA (L.) Druce, var. FLEXILIS (Rouy) Druce. Ray Island, N. Essex, Sep. 1921, DRUCE.

2182. POLYGONUM RAII Bab. Radyr, Glamorgan, SMITH.

†2196. RUMEX LONGIFOLIUS DC. One specimen with above, DRUCE & BROWN.

†2197. R. PATIENTIA L. As a solitary specimen, where it has been known for some years, Virley, Essex. Shown me by Mr G. C. BROWN. Dr Thellung says "cf. *Patientia*." To it he thus doubtfully refers Mr J. E. Little's Dock from Walsworth, Hitchin, Herts, July 1920, which was thought to be *R. longifolius*. Neither the Virley nor the Hitchin Dock agrees with true *R. longifolius*. The identification is agreed to at Kew.

†2199. R. ALPINUS L. Scalesmore Farm, Mockerkin, Cumberland, TEMPLEMAN.

†2210 (3). R. DENTATUS L. To this Dr Thellung says probably belongs a Dock gathered at Galashiels, Selkirk, in 1913, by Miss HAYWARD; Ware, Herts, DRUCE; Elland, York, HORRELL. Det. Dr DANSER, 1922, ex A. THELLUNG.

†2210 (4). R. SALICIFOLIUS Weinm. Thames-side, near Hammersmith, Surrey, BROWN; Hull Docks, Yorks, 1922, Miss A. B. COBBE.

†2210 (13). R. OBOVATUS Danser in Nederl. Kruidk. Archief 241, 1920-1921. *R. paraguayensis* Thell. in Rep. B.E.C. 258, 1920-1921 —an Parodi. Tingley, York, 1918, HORRELL; Glasgow, GRIERSON, as *dentatus* (see *Rep. B.E.C.* 146, 1920); Hull, York, in quantity, 1922, Miss A. B. COBBE. Det. DANSER.

2212. ASARUM EUROPÆUM L. Tewkesbury, Gloster, GAMBIER-PARRY.

2216. HIPPOPHAE RHAMNOIDES L. Diles Lake dunes, Llangenydd, Glamorgan, in fair quantity, 2 miles from houses, WEBB.

2217. VISCUM ALBUM L. On *Liriodendron Tulipera*. Mottisfont, S. Hants, P. M. HALL.

2236. EUPHORBIA EXIGUA L., forma CONDENSATA Druce. Near Cuckmere Haven, Sussex, 1922, G. M. WHITE. Var. RETUSA DC. Great Hallingbury, N. Essex, BROWN.

†2240. RICINUS COMMUNIS L. Cardiff Docks.

2245. ULMUS CARPINIFOLIA Borck. = U. NITENS Moench. Ilkley, Yorks, CRYER.

2246. U. PLOTII Druce. Delabeche, Sketty, Glamorgan, WEBB.

2246. U. VIMINALIS Lodd. Planted at Westonbirt, Gloster. Merely mentioned in order to say that this is not the plant which represents *Ulmus Plotii* in Plot's Herb. at South Kensington, which is labelled *Ulmus folio angusta glabro* Plot Nat. Hist. Oxford 158, 1677, as asserted in the *Camb. Flora*.

†2253 (1). HELXINE SOLERIROLII Req. Foot of a wall, Pennylan, Glamorgan, A. E. WADE; Byfleet, Surrey, Lady DAVY; in dry beds, Cambridge Botanic Gardens, Mrs M. SHARPE.

*2257. Betula nana L. Forsinard, Caithness, 1921, J. N. Bedall-Smith, ex J. E. Little. N.C.R.

2259. Carpinus Betulus L., type, but with small leaves. Pebmarsh, N. Essex, September 1922, Druce. Var. provincialis Gren. & Godr. Pebmarsh, N. Essex [Ref. No. Z 1113], September 1922, Druce.

2262. Quercus intermedia D. Don. Abbey Wood, Kent, St J. Marriott.

†2265. Juglans regia L. Seedling plants in Marcham Quarry, Berks, 1922, Druce.

†*2267. Salix pentandra L. Border of Halton Reservoir, Bucks, October, 1922, Druce. Doubtless planted.

2269. S. caerulea Sm. The Cricket-bat Willow. Twinstead, N. Essex, October, 1922, Druce. Planted.

*2285. S. herbacea L. Near the summit of Cader Idris, Merioneth, 1922, D. A. Jones.

2297. Ceratophyllum demersum L. Mr J. F. Pickard thinks that this grows in a deep pool at Wastdale Head, Cumberland, but it must be collected to verify its name.

2299. Hydrocharis Morsus-ranae L. Exeter Canal, Devon, 1922, D'Urban, without personal authority in *Top. Bot.*; pond, Titmore Green, Herts, Little.

2316. Helleborine latifolia Druce. This is the typical Northumberland plant. A. H. Evans, *in litt.*

2326 (2). Orchis praetermissa Druce. Near source of burn of Lushan, Birsay, Orkney, Johnston. Var. pulchella Druce. Kincraig, Easterness, Druce. × maculata. Stanklin Pool, Worcester, C. Rea, as a strongly bracteate fern. × Fuchsii. Hants, Lowndes.

2326 (3). O. purpurella Steph. × maculata. Kirka Taing, Fara, Orkney, Johnston.

2327. O. MACULATA L., vera. Cushie, N. Aberdeen, W. WILSON. Var. LEUCANTHA Druce. Hants, LOWNDES.

2327 (2). O. FUCHSII Druce, var. TRANSIENS Druce. Shelswell, Oxon, DRUCE.

2327 (3). O. O'KELLYI Druce. Near Buildwas, Salop, DRUCE; Greenore, in a chalk pit a few yards up the Carlingford Road, after it branches off the main road from Greenore to Dundalk, Co. Louth, DALTRY.

2332. ACERAS ANTHROPOPHORA R. Br. There are three Hampshire records for *Aceras* in Townsend's *Flora of Hampshire*, and none of these are of at all recent date while the localities given are very vague. Moreover doubt has been thrown on the occurrence of *Aceras* in Hampshire in other publications. Mr Druce, for instance, in his *Flora of Berkshire* says under this species:—" I am not satisfied with the records for Hants." So that it seems desirable to remove a slur from a country so rich in Orchidaceae and place on record two stations in the county, one in the mainland and one in the Isle of Wight, about which there can be no uncertainty. The latter was a station well-known for many years to the late Canon Vaughan, and I have more than once seen fresh specimens from there. The approximate locality is known to me but I have never had a chance of finding it for myself. The mainland station is within two miles of Winchester Cathedral, in a rough pasture beside a main road and is just within the vice county of North Hants. The station was discovered quite accidentally, for in June, 1910, I happened to meet a schoolfellow carrying a small bunch of *Aceras*, knowing not at all what he had got hold of. I failed to find the spot that year because I think I was misdirected. The next year, however, 1911, careful search revealed a small patch of 20 plants in flower. The secret of the place was guarded closely and " The Green Man " flourished till the war. Then came the catastrophe. A camp was pitched on the field, the camp became permanent, the spot where the *Aceras* grew was covered with a concrete floor. Of course the camp is demolished now but the concrete floors and foundations still remain. and every June I spend an hour wandering about among the debris hoping against hope that a seedling may appear in one of the remaining patches of turf. There was a story that an orchid lover, when the camp building commenced, dug up the tubers and planted them in a more secluded spot, but whether this pious thought was actually translated into action I cannot say. Possibly this note may have the effect of bringing to light other authenticated stations in Hampshire. In any case it is as well to place on record this one mainland station, tragic though its history may be. P. M. HALL.

2339. HABENAREA ALBIDA Br. Pastures above Cwm Du Fall, Swansea Valley, Glamorgan, RICHARDSON, ex WEBB.

*2342. H. VIRESCENS Druce. The Quenvais slopes, Jersey, 1922, Lady DAVY. Practically a New County Record.

†2363 (3). TRITONIA CROCOSMIFLORA Nich. Parkmills Woods, Blackfield, Glamorgan; Beasdale, Westerness, WEBB.

2377. GALANTHUS NIVALIS L. No doubt native at Michaelstone-y-Vedw, Monmouth, WADE.

2378. LEUCOJUM VERNUM L. Through the kindness of Mr W. D. Miller I was enabled to see this pretty plant growing at Stogumber in N. Somerset last March. Although the Rev. E. S. Marshall declared in favour of its indigenity, and although there are no other alien plants near, yet the plant seems too circumscribed in its occurrence. The habitat is one in which it should easily have been waterborne to more distant places had it long existed there. I should, therefore, put it as a denizen, as I should in the locality at Wootton Fitzpayne in Dorset.

†2390. ASPHODELUS FISTULOSUS L. Eltham, Kent, Mrs WEDGWOOD; Seaton, Devon, *Hb. Exeter*, D'URBAN.

2395. ALLIUM SCORODOPRASUM L. Near Goathland, Yorks. FLINTOFF; at Sellafield and near railway bridge south of Drigg, both places close to high water-mark, Cumberland, TEMPLEMAN.

†2396. A. VINEALE L. Between Dean and Deanscale (new to div. 1.), Cumberland, TEMPLEMAN.

2400 (2). A. NEAPOLITANUM L. Growing with *A. triquetrum*, near Penzance, Cornwall, STANSFIELD.

2403. A. OLERACEUM L. Abundant at Cuckney Haywood, Notts, GOULDING.

2405. A. SCHŒNOPRASUM L. Tintagel, Cornwall, M. UNDERHILL.

†2407. MUSCARI RACEMOSUM Lam. On rubbish, Fairford, Gloster, 1922, DRUCE.

†2408. HYACINTHUS COMOSUS L. Barry, Glamorgan, Smith.

2419. TULIPA SYLVESTRIS L. Abundant in a plantation near Walcot, Oxon, in sparing flower, a relic of cultivation. Shown to me by Mrs EDGINGTON and Mr G. HAYNES.

2423. NARTHECIUM OSSIFRAGUM Huds. At 1700 ft., Cwmyr Afan, Glamorgan, WEBB.

2427. JUNCUS ACUTUS L. Refound on Hayling Island, S. Hants, Miss HILLARD.

2428. J. CONGLOMERATUS L., *f SPIRALIS. Dean Moor, Cumberland, TEMPLEMAN.

2439. J. COMPRESSUS L. Buildwas, Salop, DRUCE.

†2441. J. TENUIS Willd. Border of Wisley Pool, Surrey, BUTCHER.

2442. J. BUFONIUS L., var. FASTIGIATUS Koch. Rostrevor, Co. Down, L. E. RICHARDS.

†2450. JUNCOIDES NEMOROSUM Morong. Grounds of Gilgarron, near Distington, Cumberland, TEMPLEMAN.

2457. J. ARCUATUM O.K. The Slioch, W. Ross, in its second locality in W. Ross, and at no great elevation, J. G. TALBOT.

2466. SPARGANIUM MINIMUM Fr. Stack o' Cassie, Aberdeen, TURREFF.

2485. Potamogeton natans L., var. rotundifolius Bréb. Pond at the Ouenet Noirmont, Jersey. Var. ovalifolius Fieb. Oxney Lode, Northants. Var. [forma] terrestris Gray. Oxford Waterworks reservoir, Druce.

2488. P. coloratus Hornem. In the Cahir River, Co. Clare, with its hybrid *perpusillus*, 1921, Druce.

*2489. P. alpinus Balb. St. Ouen's Pond, Jersey, a new record, Druce.

2495. P. nitens Weber. Ballymalis, Kerry, in the River Laune, 1921, Druce. Det. Hagstrom.

2506. P. obtusifolius M. & K. Muckross, Kerry, September 1922, rare, only two localities in Kerry, Druce.

2508. P. pusillus × trichoides. Thatcham, Berks, Gambier-Parry.

2508. P. eu-pusillus L. Ballymalis, Kerry, Druce.

*2508 (2). P. panormitanus Biv. Fleet Pond, Hants, Lady Davy.

*2510. P. trichoides C. & S. In a ditch at St Catherine's, Guildford, F. Clarke.

*2515. Ruppia maritima L. Near Borth, Cardigan, Mrs Debenham. N.C.R.

2532. Scirpus sylvaticus L. Ken Wood, Hampstead, Redgrove.

2533. S. maritimus L., var. macrostachys (Willd.). Hammersmith, Middlesex, Lady Davy.

2546. S. rufus Schrad. Sellafield (30 miles south of Hodgson's localities), Cumberland, Templeman.

2549. Eriophorum gracile Koch. Near Ash Vale, North Camp Station, Surrey, Templeman.

2558. CAREX PSEUDO-CYPERUS L., *var. MINOR Hampe. King's Norton, Worcester, BUTCHER.

2573. C. DISTANS L. Sellafield (30 miles south of Hodgson's locality), Cumberland, TEMPLEMAN.

2574. C. PUNCTATA Gaud. Between Petit Port and Corbière, Jersey, in great quantity, Lady DAVY; Polstreath Cove, Cornwall, Miss TODD.

2576. C. LEPIDOCARPA × FULVA. High Force, Teesdale, 1921, Miss COBBE.

2593. C. LIMOSA L. Cogra Moss, at head of reservoir between Lowes Water and Ennerdale Water, Cumberland, TEMPLEMAN. Neither Hodgson nor Baker give a lakeland locality. Excellent specimens.

2600. C. ELATA All. Near Broxbourne and in Gilstone Park, Herts. Very rare in the county according to the Flora but evidently overlooked in many places. In the latter locality there were several fine tussocks by the lake, DRUCE.

†2637. PANICUM CAPILLARE L. Edenbridge, Kent, G. TALBOT.

†2641. SETARIA VERTICILLATA Beauv. Hull Docks, Yorks, Miss M. COBBE.

2643. SPARTINA TOWNSENDII Groves. Now in plenty at Pagham, W. Sussex (see *Rep. B.E.C.* 687, 1919), LITTLE.

†2646 (10). BECKMANNIA ERUCIFORMIS Host. Cirencester, Gloster, GREENWOOD.

†2649. PHALARIS BULBOSA L. Hull, Yorks, Miss A. B. COBBE.

†2650 (2). P. TRUNCATA Guss. Glasgow, GRIERSON.

†2683. AGROSTIS VERTICILLATA Vill. Charleston, Cornwall, 1922, Miss TODD.

2685. A. NIGRA With. Mevagissey, Cornwall, Miss TODD.

†2719. Avena strigosa Schreber. See the valuable paper by Mr C. V. B. Marquand in *Rep. B.E.C.* 322, 1921. The following are in my herbarium :—Sub.-sp. glabrescens, var. cambrica Marq. Scotland, George Don, circa 1786. Var. albida Marq. St Luke's, Jersey; Mortlake, Surrey; Clackmannan; Antrim. Sub.-sp. pilosa Marq., var. fusca Marq. Petworth, Sussex; Moulsford, Berks; Burton Latimer, Northants; Beddgelert, Carnarvon; Buness, Unst, Shetland; Antrim.

†2721. A. orientalis L. Midgham, Berks; Yarmouth, E. Norfolk; Bodorgan, Anglesey; Antrim, Druce.

2724. Arrhenatherum elatius M. & K., var. biaristatum Druce. Par, Cornwall, Thurston.

†2737. Cynosurus echinatus L. Hayling Island, Hants, Miss Hillard; near Willen, Surrey, Biddiscombe; Burtersett, Hawes, Yorks, Miss M. Cobbe; *Drayton, E. Norfolk; Thetford, W. Suffolk, Clarke.

2738. C. cristatus L., with a lax, compound inflorescence and with two flowering stalks on the same stem. Battlehillocks, by Lumsden, N. Aberdeen, W. Wilson.

*2741. Koeleria britannica Domin. Seascale, Cumberland, Templeman.

†*2755. Briza maxima L. Drayton, E. Norfolk, Clarke.

*2768. Poa bulbosa L., and the var. vivipara. Gorey Common, Jersey, in quantity, Lady Davy. A most interesting addition to the Channel Islands Flora.

2776. Glyceria maritima Wahl., var. distantiformis Druce. Bridport, Dorset, A. W. Graveson.

2778. G. procumbens (Curt.) Dum. West Bay, Fridport, Dorset, A. W. Graveson.

†2794. Bromus rigens L. Bournemouth cliffs, in plenty, June, 1922, Sherrin; Ware, Herts, 1922, Druce.

2798. B. MADRITENSIS L. Radyr, Glamorgan, SMITH.

†2799. B. RUBENS L. Cardiff Docks.

†2803. B. UNIOLOIDES H. B. K. Radyr, Glamorgan, SMITH; Hull Docks, Yorks, Miss M. COBBE; Drayton, E. Norfolk, CLARKE.

2807. B. COMMUTATUS Schrad., var. PUBESCENS Druce. Tregehan, Cornwall, THURSTON.

2809. B. ARVENSIS L., var. DUVALI? Wimbledon, Surrey, SHERRIN & ST J. MARRIOTT.

2811. B. HORDEACEUS L., var. LEPTOSTACHYS (Pers.). Killin, Perth, FRASER, teste THELLUNG; dell, Grangetown, Glamorgan, WADE.

†2817. B. JAPONICUS Thunb. Highnam, Gloster, GAMBIER-PARRY; Bristol, SANDWITH.

†2823. LOLIUM MULTIFLORUM Lam., var. PERENNANS A. & G. Iver, Bucks, COOPER, as *siculum*. Var. MUTICUM. Drayton, E. Norfolk, CLARKE.

2828. AGROPYRON PUNGENS R. & S. Ray Island, N. Essex, DRUCE; Walton-on-the-Naze, N. Essex, BROWN.

2830. A. REPENS Beauv., var. LASIORACHIS Hack. Abbey Wood, W. Kent, GRINLING & ST J. MARRIOTT.

†2845. LEPTURUS FILIFORMIS Trin. Coatbridge, Lanark, GRIERSON.

*2850. HORDEUM MARINUM Huds. Kincardine, 1858, *Hb. Bell.* Doubtless an alien.

†2851. H. JUBATUM L. Between Truro and Malpas, Cornwall, Miss TODD.

2854. H. TRIFURCATUM Jacq. Himalayan Barley. Belvedere, near Abbey Wood, W. Kent, POORE & ST J. MARRIOTT.

*2866. EQUISETUM MAXIMUM Lam., var. SEROTINUM Braun. Between Penarth and Cardiff, Glamorgan, 1922, Miss VACHELL.

2867. E. LITORALE Kühl. Between Brookwood and Bagshot on a wet, sandy slope facing south, Surrey, TEMPLEMAN.

2872. E. HYEMALE L. Lordswood, S. Hants, 1912, RAYNER.

2883. ASPLENIUM LANCEOLATUM Huds. Near Carnsore Point, Wexford, STELFOX.

2920. OPHIOGLOSSUM VULGATUM L. South Carr brickfields, Notts, GOULDING.

†*2923. AZOLLA FILICULOIDES Lam. Gold Cliff, J. D. DEAN, ex WADE; below Magor and Undy, Monmouth, REDGROVE.

2927. LYCOPODIUM ALPINUM L., var. DECIPIENS Syme. Great Gable, Cumberland, TEMPLEMAN.

*2941. NITELLA SPANIOCLEMA B.-Webst. Loch Lubnaig, Perthshire, 1921. See Canon B.-WEBSTER in *Journ. Bot.* 149, 1922. New to Britain.

2944. TOLYPELLA INTRICATA Leonh. Pond near Yarnton, Oxon, May 1922, DRUCE.

*2951. CHARA RUDIS Leonh. Loch of Langarnay, Sandy, Orkney, JOHNSTON.

2958. C. DELICATULA Gr. & B.-Webst. Wareham, Dorset, Miss TODD.

HERBARIA.

BY

G. CLARIDGE DRUCE.

The word Herbarium was first applied to works treating of plants, and is said by St Lager to have been used in the fourth century for the *Materia Medica* of Dioscorides, and *The Grete Herbal* of 1516 describes plants and is not a collection of them. Restricted to a collection, indeed, the Oxford Dictionary gives the first evidence as Linnaeus' *Philosophia Botanica* of 1751, and in the third edition of Withering's *Natural Arrangement of Plants* of 1796 directions are given as to forming and storing a herbarium. There are, however, earlier examples, and we have in *Herbarium Diversarum Naturalium* a title affixed to a book of dried plants, often called a Hortus Siccus, made by Gregory, of Reggio, in 1606, a very early use of the name to signify not a printed work but a collection. Penzig says the word *Herbarius* is used on October 27, 1556, in that sense by the great naturalist, Conrad Gesner, in a letter to C. Wolf. If it is difficult to fix the precise date of the first use of the word, the identification of the first maker of an herbarium is also not free from trouble. The garlands of flowers placed in Egyptian tombs do not stand in this category. It is unlikely that during the period in which the nearly impervious papyrus or vellum or parchment formed the writing material that the pressing and drying processes were discovered. It would not be many ages after the introduction of paper, however, before it would be found that a flower pressed between the sheets would dry and retain its shape and sometimes its colour. Perchance between the vellum or parchment sheets of some missal an accidentally pressed flower which the limner had been copying for illumination in the text, may have suggested the process. But it was not until paper was fairly cheap that it would be used for such a purpose. The invention of paper-making appears to have been of Chinese origin. It is known that for a period as remote as two centuries before the Christian era the process was known to that people who prepared it from various substances, such as the stems of rice, leaves of the Paper Mulberry (*Broussonetia* *papyrifera*), from hemp, flax, silk, and cotton. The manufacture spread westwards to Persia. In 751 the Arabs in Samarcand obtained, by means of torture, the secret of making it from some Chinese, who had attacked the town, and whom they took prisoners. The Arabs carried this knowledge to Mecca. Thence the Moors conveyed the process to the South of Spain, to a town once called by the Romans Saetabis, but named by the Moors Xativa (now disguised under the name San Felipe Neri) then celebrated for its superfine flax, and where cotton was then and is still grown. By the twelfth century paper, presumably made of linen, was exported from that place to the countries West and East. Elche, with its grove of Date Palms (*Phœnix dactylifera*) is not far away from Xativa, and the aspect of the whole region is distinctly reminiscent of the East. The earliest printed work treating of plants is probably by Bartholomew Glanville, *Liber de proprietatibus rerum*, of 1481. We are now enabled with some accuracy to attribute to Luca Ghini, Professor of Botany at Bologna, the honour of being the first to form an herbarium, for although there are no actual remains in existence we have positive evidence that five of his pupils, two of whom were Englishmen, made such collections of dried plants. From this fact alone we may safely attribute the credit to Luca Ghini. He was Professor of Botany at Bologna from 1534-44, and then went to Pisa where he died in 1556, having handed over to Mattioli all his material—of which no trace is now to be found.

We give one or two early references to collections of dried plants. In 1543 Bartolommeo Maranta (an Italian botanist whose name Plumier applied to the arrow-root yielding genus, *Maranta*), writing to Matthioli (*Lib.* iv.), states:—" Non negaverim plures me dedisse plantarum imagines quae e siccis plantis ad me transmissis delineare curaverim, sed affirmaverim, quod aquae gelidae maceratione contractas e siccitate rugas adeo in iis extenderim, ut hac ratione redivivae et parum admodum a viridibus distantes viderentur," and Amatus Lusitanus, whose real name was Jean Rodrigo de Castell Branco of Coimbra, in Portugal, who had travelled not only in Turkey, but had visited and made friendships with botanists in Spain, Italy, France, Holland, and Germany. When at Ferrara he met Antonio Musa Brasovola, Professor of Physics there about 1542. He was shown John Falconer's book as a singular curiosity such as he had never seen before. [*Enum.*, Dioscorides 322, 1577.]. Falconer was an Englishman who had studied at Bologna under Ghini from whom, doubtless, he learned the method. Falconer's book is also alluded to by Turner, the father of British Botany, who had also been a pupil of Ghini's. Turner afterwards became Dean of Wells, but the second portion of his Herbal was printed in Cologne in 1562. In it he says of Pistacea (p. 91 bis), "It may chance that Matthiolus hath seen the leues of the forsayde trees of greater or lesse bygnes and of other fasshon and color then they were of that I saw in Bonony (Bologna) whereof I haue certayn at thys day to shewe, well kept in a booke at the lest these seuentene yeares [1562-17=1545], if any man shulde dout of my truth in the rehersall of these maters"—and, again, but still earlier, in the first part of the Herbal printed in England in 1551 under " 'Sea Trifoli' Glaux, otherwise called Engalacton," Turner says, " I never saw the true Glaux in England savinge onelye in Master Falkowner's booke and that had he brought out of Italy except my memory do fayle me. I saw it ones in Flanders by ye sea-syde about three miles beyonde Dunkyrke." *Glaux* has been identified by Mr Britten, surely in error, with the Portuguese and Spanish *Astragalus Glaux*, which is not given by Nyman either for Flanders or Italy. The *Glaux* of Cibo is *Anthyllis Vulneraria*, which grows in both countries, which moreover Turner does not record as British. In his *Names of Herbes* of 1548 he also alludes to this plant but does not mention Falconer's book. Therefore we know that from Bologna sprang this new method and we have evidence to show that Ghini sent plants so prepared to Pier Mattioli shortly after the publication at Venice of his *Commentary on Dioscorides* in 1544, a work which ran through many editions. Its author was an Austrian physician, a native of Sienna, who died of the plague at Trient in 1577. So to Ghini is to be ascribed the honour of first preparing Herbaria.

We now propose to deal with two of his pupils—those whose herbaria are the earliest known to exist.

The oldest is that prepared by Gherardo Cibo, which is preserved in the Bibliotheca Angelica in Rome.*

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* Enrico Celandi sopra un Erbario di Gherardo Cibo in Malpighia xvi., 180-226. See O. PENZIG Contribuzioni alla Storia della Botanica. E. CHIOVENDA a proposito dell'Erbario di Gherardo Cibo 1904. Ann di Bot. fasc., i. 1903.

Cibo came of an illustrious family. A relation of Pope Innocent, he was born in Genoa in 1512, and went with his father, Aranino Cibo, to Rome in 1526, escaping the slaughter in the 'Sacco di Roma.' With his parents he went to the Duke of Varano at Camerino, and then he came in 1529 as a pupil to Ghini, staying with his uncle, the Cardinal, at Bologna, and was a diligent scholar. In 1532 he accompanied his father, who was sent as Ambassador to the Emperor, Charles V., then at Ratisbon. They travelled through the Trentino and then to Ingolstadt, where he met, in 1533, the great Flemish botanist, Fuchs, with whom he kept up a correspondence and for whom he had the greatest respect. On this journey he collected plants which are in his herbarium (A). In 1534 he returned to Italy to Agrano, near Pisa, with Lorenzo Cibo, Marchese di Massa, and when there doubtless made a journey into the Appian Alps, from which there are specimens in his herbarium. In 1539 he accompanied the pontifical legate, Farnese, to the Court of Charles V., visiting the Monastery of Sysla, near Toledo, and made a rapid journey through Bayonne to Paris and Ghent, which occupied four months. In 1540 he parted company with the Legate and definitely retired to Rocca Contrada in Umbria, making only short excursions during his lengthy life, varied by a brief visit to Rome in 1553. Here, in quiet country pursuits, his time was occupied in making a very beautiful series of plant paintings, which are most delicately finished. His copy of the grand edition of Fuchs *Historia* of 1542 is ornamented by some drawings of considerable merit.* If Mattioli, in his rare edition of 1548, speaks slightingly of Fuchs, Cibo has made a broad dash across the sentence which almost obliterated the criticism and shows how highly he appreciated that great draughtsman, an inspirer of engravers. He was also in correspondence with botanists, and one of his letters is preserved in the Aldrovandi collection dated from Rocca Contrada, March 26, 1578. He died at Rocca Contrada in 1600, aged 88 years. The Herbarium consists of two sets. One, the older, designated by Penzig, A., is more fragmentary, is less well prepared and less well arranged and is doubtless the work of his prentice hand. It is contained in a volume which has suffered much. It was unprovided with guards, so that when the specimens were inserted it caused the book to bulge so as to expose the contents. The size of the white paper is 32.2 x 19.5 cm. It contained 515 numbered plants (some are now destroyed). They are not arranged in chronological or alphabetical sequence. They consist of native species as well as plants of medicinal and horticultural interest.

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* Now preserved in the Bibliotheca Angelica.

Two plants in it leap to the eye—*Zea Mays* and *Opuntia vulgaris*—since here are these two American plants gathered in an Italian garden so shortly after the discovery of America. Both are also represented in Aldrovandi's herbarium and the Maize is represented in Rauwolf's herbarium at Leyden as a specimen gathered by him at Birra, in the Euphrates Valley in 1574. Fuchs figured it in 1542, but as a variety not now in cultivation. The collection includes the orchids *O. militaris*, *O. purpurea*, and *Ophrys Bertolonii*, and excellently preserved specimens of *Anthyllis Vulneraria*, *Anagallis arvensis* and *fœmina* with the colour well retained, *Veronica Chamædrys*, *Mathiola incana*, *Satureia Thymbra*, but this is probably a cultivated specimen, and *Pædorota Bonarota* among others.

The HERBARIUM B. is in much better condition and contains better specimens. It is arranged in alphabetical order in four volumes, containing about 1347 plants. The scientific name is in Cibo's hand and he has appended the abbreviation for some of the authors cited. It is labelled "Plantarum seu Stirpium Naturalium." The paper is of different makers, with different watermarks. Many of the names used by Cibo are still retained—*Aconitum Lycoctonum*, *Anagallis fœmina*, *Cannabis sativa*, *Chelidonium majus*, *Dipsacus sylvestris*, *Hedera Helix*, *Nymphæa lutea*, *Origanum Onites*, *Trifolium pratense*. It contains many very interesting species.

His *Epipactis* is *Botrychium Lunaria*, his *Filix mas* is *Polystichum*, his *Glaux* is *Anthyllis Vulneraria*.

Altogether 1442 species are represented in the Herbaria, which may be compared with 768 in that of Cesalpino, Girault 313, Rauwolf 973, Aldrovandi 5000. The majority of the plants of Cibo's come from Central Italy, but, as we have said, many are ornamental species from the garden, others are medicinal or useful in the arts. He has also inserted some plants bearing galls, and he has given some of the vernacular names to the species.

Owing to the absence of *Zea Mays* and *Opuntia* from the Herbarium B. we may assume that they were grown in the Bologna garden, which he perhaps did not visit again.

ULYSSES ALDROVANDI.

Much larger than Cibo's collection and only a very little later is that of Aldrovandi, who, like Cibo and Turner, was a pupil of Ghini, which is in existence at Bologna and which it was my great pleasure to see this spring. Before alluding further to the Hortus Siccus some notice of its extraordinary collector may be given, since his early experiences are in a high degree romantic.

Ulysses Aldrovandi, never did a botanist receive a more fitting prenom, was born at Bologna on September 11, 1522. His father, Chancellor-Secretary to the Senate of that city, died when Ulysses was only six years of age. Probably this led to his being a little spoiled by his mother and caused him, bright and precocious as he was, to be self-reliant and probably self-willed. At the age of twelve he was apprenticed to a rich merchant at Brescia, but disgusted with a commercial occupation found his way back to Bologna, where at the entrance to the city, near the Castel San Pietro, he encountered a young Sicilian, who told him he was going on a pilgrimage to the shrine of St James at Santiago de Compostella, in Spanish Galicia, then a most popular pilgrimage, so numerous being the stream of visitors that it gave the popular Spanish name to the Milky Way—El Camino de Santiago. The Saint who attracted these crowds of pilgrims was James, the Son of Zebedee, whose remains were said to have been brought here in the twelfth century. The first cathedral built over the body of the Apostle was built in 874 and consecrated in 899. The Moors at Cordoba, jealous of the reputation of Santiago, made an attack upon it and Al Mansur entered the city in 997 and razed it to the ground. The bells of the cathedral with other booty were brought back by Christian captives to Cordoba, where the bells were hung up reversed as lamps in the great Mosque until Ferdinand restored them in 1236, sending them back to Santiago on the shoulders of Moorish prisoners. So the historic reputation of Santiago with all its romantic accessories dazzled the boy eager for adventure. In his sixteenth year he started on foot on his long journey, thus emulating his Greek forerunner, with the Sicilian, without money or delaying even to enter the walls of colonnaded Bologna or to bid his mother and friends farewell. They travelled to Modena, Reggio, afterwards the home of Gregory, one of his botanical correspondents, over the hills to Genoa, along the littoral to the harbour of Savona, then without its cathedral, to Nice. They swam the river Var and entered Provence, then occupied with Italian and Spanish troops at war with the King of France. They crossed the Rhone and went through Languedoc, visiting Monpellier, sixty years before the Botanic garden was founded there. Their way led through the mosquito-haunted and dirty Narbonne, with its relics of Roman conquerors, and across a malarious country to the Spanish-looking Perpignan, with its then unfinished cathedral. They determined to reach Barcelona by the Col du Perhus, which had been crossed by the conquering army of Pompey. In the Pass the boys were met by brigands who stripped them naked, taking even their boots and shirts. In very simple and airy attire they reached Barcelona, where reclothed they passed on to the picturesquely situated and renowned Catalonian monastery, where in pure refreshing air they stayed three days to pay their devotions to our Lady of Montserrat. Then they started with renewed zeal for their long tramp through arid Arragon, Navarre, and hot and dusty Castille. Doubtless they passed through Burgos, swept with the bleak winds from the Guadarramas and admired the Gothic Cathedral, whose architect was the English Bishop Maurice, and with dreams of emulating the Cid they eventually reached Santiago and stayed there twelve days, offering their prayers at the shrine of their pilgrimage, and obtained help from the pilgrims. The sea air of the west tempted them, so they walked to Cape Finisterre to breathe the Biscayan breezes, and in order to avoid retracing their steps determined to cross the Galician mountains. For two days they saw no sign of habitation and were nearly starved, living only on such fruits and plants as they found. Nearly worn out with famine and fatigue they reached Valladolid, where Colombus died about 34 years before and when Philip the II., whose birthplace it was, was then about 14 years old. Next they struck out for Marseilles by Zaragossa, through Languedoc. They embarked for Genoa from Marseilles, a voyage not without incident since they were soon pursued by corsairs and obliged to return. Eventually the young Ulysses succeeded in reaching Genoa the Superb, and not caring even then to return to Bologna suggested a pilgrimage to Jerusalem. His Sicilian companion, having had enough of mendicancy and its privations, decided, if not to return to the flesh-pots of Egypt, at least to go back to the lemon-groves of Sicily, and Ulysses, being left companionless, returned to Bologna, where his mother and brother, Achille, who had long thought him dead, welcomed him with great joy. Here he was induced to stay, and at the University he studied rhetoric, philosophy, mathematics and medicine, among others of the liberal arts, too liberal perhaps, for the authorities sent him to Rome and subjected him to the Inquisition. Released after several months' detention, he stayed in the Imperial city long enough to write a work on the Antiquities of Rome, and had his interest directed to the study of Natural Science owing to his meeting Rondelet, Professor at Montpellier, and Paulo Giovio, celebrated naturalists, then studying Ichthyology. At the age of 28 Aldrovandi fortunately met Luca Ghini at Bologna, who inspired him with a love of Botany, in which subject he instructed him, and one of the MS. lectures given by Ghini (vol. iii, c. 2-106) is still preserved at Bologna. In 1551 with Luigi Anguillaria, the director of the Botanic Garden at Padova, Monte Baldo and two other hills were explored. On his return Aldrovandi stayed at Padova to receive lessons from the celebrated Gabriel Fallopia, and in 1553 he explored the environs of Rimini, the Alvernian mountains, Loreto, Ancona, and the Italian coast of the Adriatic where, for the first time, he collected plants for his herbarium.

Returning to Bologna he obtained a doctorate in philosophy and medicine, and was given the title of lecturer in logic, philosophy and natural history. In 1568 he made the Botanical Garden at Bologna. The care of this, with his herbarium, his museum, and animals occupied his life. His means must have been considerable for he employed two secretaries and three clerks, and he had painters and engravers whom he paid well, but this outlay nearly ruined him. He appealed, and not in vain, to the Popes Gregory XIII. and Sextus V., to the Dukes of Toscany and D'Urbin, and to the Cardinals and Archbishop for aid, and with their assistance he was enabled to produce three volumes on ornithology and one on entomology.

Aldrovandi died on November the tenth 1605, aged 85, having by his will left all his collections, library and MSS. to the City of

Bologna. This bequest included his herbarium, which is preserved in 17 folio volumes of 4,378 sheets of paper. It contains about 5000 specimens. The covers of each volume are of ancient parchment sometimes ornamented with figures. The sheets of volumes 1-14 measure 14 x 21 cm., vols. 15-17 are larger, measuring 23 x 34 cm. The plants have the Latin names attached in Aldrovandi's hand. He quotes such authors as Fuchs, Dodoens, Gesner, Lobel, and Clusius. In the course of three centuries the herbarium has undergone strange vicissitudes. After being preserved for many years in the University Library, in 1796, after the war, the French Republic ordered it to be removed to the Natural History Museum at Paris. At the treaty of Vienna, in 1815, it was ordered that the Herbarium should be restored to Bologna. Then after years of tranquillity it was moved, in 1875, to the Botanic Garden. Now again it is placed in a case in the room set apart in the Library for the works of Aldrovandi, where the MSS., the wood-blocks, and other personalia of Aldrovandi are well and, it is to be hoped, permanently housed. The collection, although it has had such adventurous episodes, is still in good condition, though some of the specimens, especially those in vols. I. and II., have been too liberally poisoned with a strong solution of corrosive sublimate, but the majority may be identified. The first specimen is *Absinthium ponticum Matthioli*, the last in the 17th volume, is *Helxine* seu *Parietaria*. Some bear names which are still valid—*Anagallis foemina*, *Pinus sylvester*, &c. The bulk of them are native plants of Italy and from natural localities, although few, if any, are definitely localised. He gives occasionally the vernacular name, *e.g.*, Herba Sancti Alberti for our St John by the Hedge, *Barbarea vulgaris*.

A detailed list is still a desideratum, although O. Mattiolo in *Malpighia* (xii., 1899) has enumerated those in the first volume.

On the tercentenary of the death of Aldrovandi a catalogue of his MSS. was prepared by Lodovico Frati, with Alessandra Ghigi and Albano Sorbelli, which was published at Bologna in 1907. It contains a portrait of Ulysses copied from that in the first volume of the *Ornithologia* of 1599, and there is also a reproduced page of his writing. The catalogue of his MSS. extends to 208 pages. There are in the collection letters from Gregory of Reggio, Cibo, Fabio, Colonna, Lobel, Robin, Luca Ghini, Mathioli, Gherardo Cibo, and the chief contemporary botanists, and from Popes, Cardinals, Grand Dukes and other notabilities. There are still preserved many coloured paintings of animals, plants, flowers and fruits, which are also catalogued.

A biography of Aldrovandi, to which I am greatly indebted, was written by Giovanni Fantuzzi under the title *Memorie della vita di Ul. Aldrovandi*, and was published at Bologna in 1774. Further very important details are given in Saint-Lager's *Histoire des Herbiers*, published in 1885, Camus *Hist. des Premiers Herbiers*, 1895, and I am also greatly indebted to Dr B. A. Longo, of the Botanical Department, and to the keeper of the Bologna Library for great kindness. There can be no doubt that the Herbarium of Aldrovandi is the most important of the early collections, and that it appears to be actually the second oldest in the world. His name is commemorated in the monotypic Droseraceous genus *Aldrovanda*, which was dedicated to him by Monti of Bologna in 1747, and subsequently adopted by Linnaeus. The name of Monti himself is connected with the genus *Montia*.

It is now necessary to account for the third Italian pupil of Ghini who prepared a Herbarium, but in the interim one was made in France which takes precedence because it is five years older. This was made by Jean Girault, a native of Lyons, a celebrated surgeon and a pupil of the botanist, Dalechamp, who may possibly have heard of the method from Cibo. This collection was begun on August 4, 1558, and contains 313 specimens chiefly of Lyonnais plants. It is preserved in the Jardin des Plantes at Paris and consists of a volume bound in parchment covers. This passing notice must suffice and we proceed to allude to the Herbarium of Andrea Cesalpini who was born at Arezzo in 1519, and died at Rome in 1603. A pupil, as we have said, of Ghini, he began this collection in 1563 (he had two, but one is lost). This is much smaller than that of Aldrovandi, consisting only of 768 plants. It is titled "Illustratio in Hortum Siccum A. Caesalpini," and is now preserved at the Botanical Garden at Florence. It was originally dedicated to Alphonse Tornabuoni, Bishop of Florence. It then passed into the possession of the Pandulphi family where it rested unrecognised until 1717, when the great botanist, Micheli, discovered it in the Pandulphi Palace, and made use of it. Again the Herbarium was lost sight of till 1818, when it was found by Octave Targioni in the Nencini Library, the Nencini family being the heirs of the Pandulphi. Then, in 1844, it was presented to the Natural History Society of Florence, and, under the care of Parlatore, the celebrated author of the *Flora Italiana*, the plants were poisoned and distributed into three volumes. It consists not only of native plants of Tuscany but of cultivated specimens. On each sheet Cesalpini has written the Greek, the Latin, and the vernacular name. It must be remembered that Cesalpini was not only a field botanist, but that he was the father of systematic botany, and one of the earliest to elaborate a system (*De Plantis*, 1553, dedicated to Francis, Duca de Medici) based on the structure of the fruit and seed—the foundation of the Natural System. Like his Hortus Siccus, its merits remained buried for over a century, but if his herbarium had been readily consultable this neglect could hardly have occurred since it is arranged in a very natural manner illustrating his views. It is true that he was saturated with the Theophrastian idea of grouping together all shrubs and trees irrespective of the seed or fruit structure. This, too, was done by Morison, a century later. The herbaceous plants, however, are naturally arranged, that is, the Umbelliferae, Valerianaceae, Boraginaceae, Compositae (with which he united the Dipsacaceae), Graminaceae, Cyperaceae and Juncaceae, Labiatae, and so on, are brought together—a great forward step, and one that was not followed by the generality of botanists of that or indeed the immediately succeeding era. In the *De Plantis* he was the forerunner of Harvey in the discovery of the circulation of the blood. Speaking of the arterial system he says the blood "per arterias in universum corpus distribui." Plumier named the beautiful genus of the Leguminosae *Caesalpinia* after him, and Linnaeus adopted it in his *Genera Plantarum*.

CENTAUREA SCABIOSA L.

VARIETIES AND A HYBRID.

C. E. Britton.

The varieties and fluctuations of *Centaurea Scabiosa* L. have hitherto not received as much attention as they deserve from botanical writers and collectors in Britain. Messrs Marshall and Shoolbred observed at Tongue Bay, Sutherland, in 1897, a very peculiar form with more or less undivided leaves, and again collected it at the same locality in 1900. This form was described by Marshall under the varietal name *succisaefolia*, in allusion to the resemblance of its basal leaves to those of a luxuriant local form of *Scabiosa succisa* (*Journ. Bot.* 1901, 268). A few years later the Rev. H. J. Riddelsdell distributed examples of a similar plant collected on cliffs on the Welsh coast, where he had first observed it as early as 1897. In the meantime Mr F. N. Williams had published part 2 of his *Prodromus Fl. Brit.* (Nov. 1901), in which the plants collected by Messrs Marshall and Shoolbred were referred to the earlier-published var. *Gelmii* Briquet, and two other varieties were added, var. *coriacea* (= *C. coriacea* Waldst. & Kit.) and var. *angusiensis*, the latter founded on plants in Herb. Brit. Mus. collected by George Don on the coast of Angus-shire, and identified by him as *C. intybacea* Lam. & DC.

These varieties of the *Prodromus* merit enquiry as it appears doubtful whether any one of them can be maintained for the plants indicated.

(1) "*β. coriacea* (Wald. & Kit. (sp.) Pl. rar. Hung. ii., p. 212, t. 195 (1805); (var.) Koch Syn. Fl. Germ. Helv. ed. 1, p. 412 (1837).—Folia glabra, margine scabra. Periclinium fere glabrum." The definition of this is identical with that used by botanists from Koch to Beck. British plants collected (1) by Rev. W. H. Painter at Worle Hill, Somerset, and (2) by Mr Chas. Bailey between St Andrews and Kinkell Ness, are thus identified. The specimens, which are in Herb. Brit. Mus., do not agree with the description given, as it can plainly be seen in each case that the leaves are *not* glabrous, but are on both surfaces clothed with short, rough hairs. As to the

name *C. coriacea* Waldst. & Kit., Hayek has arrived at the conclusion that it cannot be upheld. His reasons are given *in extenso* in *Centaurea-Arten Osterreich-Ungarns* p. 45, 1901, where it is said that the original examples of this in Willdenow's herbarium consist of specimens of *C. Scabiosa* L., and *C. Sadleriana* Janka, and the figure of Kitaibel to represent undoubted *C. Scabiosa* with broader and less rough leaves than usual. For the *C. coriacea* and *C. Scabiosa*, var. *coriacea* of many German and Austrian botanists, the name *C. Fritschii* was established by Hayek. It is a plant with very narrow segments (40-50 mm. long by about 5 mm. wide) in the upper leaves, and is said to be readily distinguished from typical *C. Scabiosa* by the more coriaceous texture of the foliage, glabrous above, and also by the narrower, marginal membrane of the phyllaries. No British plants at all resembling this form have come under observation. The distribution is from Styria to the north-west of the Balkan peninsula.

(2) "var. γ. *angusiensis* mihi.—This plant is the reputed *C. intybacea* of G. Don, with stems more branched than in the type. The original specimens, which are in the British Museum Herbarium, I have examined and compared with other Scottish forms. . . . . ." It is difficult to understand why the character of stems more branched than in the type should be attributed to Don's specimens as these certainly do not show such a feature. There are two examples on one sheet, one with an unbranched stem with one terminal capitulum, the second with a terminal and two lateral peduncled capituli. Quoting from Smith's *English Flora* iii., p. 468, the author of the *Prodromus* says:—"It has deeply furrowed and narrowly divided foliage." Smith, however, did not use the word "furrowed." Don's specimens do not show any especial feature to take them away from ordinary *C. Scabiosa*, and the use of a varietal name is not justified.

(3) "var. δ *Gelmii* Briq. in Bull. Herb. Boiss. p. 475, 1897." In Herb. Brit. Mus. is a fine series of Marshall's plant from the herbarium of the Rev. E. F. Linton. A study of them reveals a character that prevents them being associated with Briquet's variety but, to make this clear, it is necessary to refer to that author's arrangement of the forms of *C. Scabiosa* in *Mon. Cent. Alp. Marit.* pp. 180, etc., 1902. There two groups are recognised:—"A. Bord

scarieux des écailles involucrales à franges médiocres ne cachant pas l'involucre. B. Bord scarieux des écailles involucrales à franges allongées (2-3 mm.), moins foncées que dans A, parfois argentées, cachant ± l'involucre. Calathide souvent plus grosse que dans A. ' Section A contains var. *Gelmii*, among others, whilst section B includes var. *alpina* Gaud. (*C. alpestris* Heg. et Heer). Marshall's Tongue Bay plants show the involucres more or less closely covered by the black appendages, consequently the name *Gelmii* cannot rightly be applied to them, and it will be necessary to use instead for the Scottish and Welsh plants the name originally used by Marshall—var. *succisaefolia*. With this view Mr C. C. Lacaita, who has seen a series of the Welsh form, is in complete agreement. In Britain the variations presented by *C. Scabiosa* are innumerable; the leaves may be undivided or multifid; the stems short and simple or tall and much branched; the pericline roundish or ovoid-elongated, glabrous to conspicuously arachnoid; the florets may be purple or white or pinkish; the stems and leaves may be roughly hairy or sub-glabrous or glabrescent, etc. Some of the phases are transitory; others permanent, such as the undivided leaves of var. *succisaefolia* and of the parallel form, var. *Gelmii*, which transmit their peculiarities to their offspring.

f. *discoidea* Uechtr.—Capituli devoid of marginal radiant florets. —Of occasional occurrence, Surrey, etc.

f. *cretacea* Wörlein—Phyllaries densely arachnoid. Surrey, etc. Oxon (Bullingdon) Dr Druce. Ref. No. Z 830.

f. *dumetorum* Beck—Phyllaries small, brownish, acuminate, teeth short, irregular, wavy, densely arachnoid; upper surface of leaves copiously punctuate, segments of upper leaves linear. v.-c. 29, Cherry Hinton (Herb. Riddelsdell); v.-c. 33, Whelford (Herb. Riddelsdell); Surrey, E. Kent, Hunts, Berks (Herb. Druce); Oxon (Herb. Druce). Seldom typical. The segments of the upper leaves are frequently linear-oblong; the appendages black, rather than brown, and the tomentum disappears as the autumn advances. The punctuation appears constant.

Var. *silesiaca* Borbas—Phyllaries terminating in a conspicuous, more or less spreading, spine. = *C. Scabiosa* L., var. *spinulosa* Koch, non *C. spinulosa* Rochel.—Surrey, N. Hants (C. E. Palmer in Herb. Druce).

Var. *Riddelsdellii* var. nov.—Capituli small (2 cm. by 1.5 cm. in herb.), borne on simple, conspicuously elongated branches (12 to 20 cm.), naked above or with rudimentary leaves; pericline ovoid; phyllaries appressed, acuminate, slightly spinulose; appendages black, concealing greenish phyllaries; teeth light brown or whitish.—Gloucester: Crichley Hill, Rev. H. J. Riddelsdell (see *Rep. B.E.C.* 826, 1919). A plant collected at Radyr, v.-c. 41, by Mr Riddelsdell is almost identical with the Crichley Hill plant which appears to be rayless.

f. *incisa* C. E. Britton—Leaves pinnatisect; rachis very narrowly winged, hirsute, segments spaced, oblong or elliptical, acute, narrowed at base, lobate-serrate, pubescent above, thinly hirsute beneath.—S. Essex and Cornwall (Loydell in Herb. Druce); v.-c. 33, Herb. Riddelsdell.

f. *multifida*.—Leaves bipinnatisect; rachis narrowly winged above, scarcely or not at all towards the base, hirsute, segments triangular or rhomboid, sub-petioled, lobes oblong or lanceolate, dentate-pinnatifid, strigose above and on principal veins below; segments of lower leaves densely imbricated. This form with much-divided leaves cannot be var. *dissecta* F. Gérard (Rouy Fl. Fr. ix., 146) as that is described as having coarsely hairy leaves with linear divisions, besides being a small plant, whereas f. *multifida* is twice the size given.—Surrey.

f. *heterophylla* Beck—Lower leaves undivided, elliptical, tapering into the petiole, acute, irregularly serrate-dentate, or even somewhat lobed, upper leaves pectinate-pinnatipartite.—Yarnton, Oxon (Herb. Druce); Surrey.

Var. *Gelmii* Briq.—The following description is taken from *Monographie des Centaurées des Alpes Maritimes* by Dr John Briquet. " Plante haute de 30-50 cm. Feuilles basilaires oblongues ou oblongues-lancéolées, aiguës ou subobtuses au sommet, d'un vert de mer, parfois rougeâtres, convertes sur les deux faces de poils courtes, rudes, épaisses, indivises, irregulièrement crénelées-dentées; les supérieures plus étroites et plus courtes, lyrées ou faiblement pennatilobées à la base d'ailleurs indivises. Calathides dans a l à fleurs cependant plus petites." Surrey: Effingham; cultivated specimens [Ref. No. 1841] distributed by the writer through the Botanical Exchange Club.

Var. *succisaefolia* Marshall in Journ. Bot. 268-9, 1901.—Basal leaves numerous, lamina undivided, oblanceolate or elliptical, entire, serrate, dentate, or serrate-dentate, subacute, 10-15 cm. long, more or less hispid, especially on the midrib below, narrowed into a petiole about as long as the lamina; lower stem-leaves undivided, petioled, upper sessile undivided, or more usually pinnatifid at base, lobes two or three pairs, oblong-linear; stems from 10 to 90 cm., simple or branched, branches few (2-3); capituli variable, more or less globular, 2-3 cm.; pericline black, or variegated yellow and black, according to the degree of development of the membraneous edge of the phyllaries. The description of this variety given by Marshall and the allusions to it by Messrs Marshall and Shoolbred in *Journ. Bot.* 170, 1898, fail to draw attention to a conspicuous feature seen in herbarium specimens. Numbered exsiccata are not quoted, as Marshall's specimens bearing identical numbers do not always agree. Taken as a series, the capituli are remarkable for the way in which the green portions of the phyllaries are hidden by the dark appendages, in some completely, in others less so, and again, there are specimens that are transitional in this respect. Before the capituli were subjected to pressure during drying it is extremely likely that all showed the black appendages closely covering the phyllaries. It is therefore suggested that the varietal name *Gelmii* cannot be applied to the Sutherland plants, and for the present we must use the name given by Marshall. The diagnosis of var. *integrifolia* Gaudin Fl. Helv. 5, 404, 1829, " foliis lanceolatis pleris-que indivisis superioribus pinnatifidis " certainly covers all the British plants that have been referred to var. *Gelmii*, but Briquet rejected the name of Gaudin for the plants to which he applied the name *Gelmii*, for the reason that the leaves of the latter are not entire but clearly crenate-dentate, and, moveover, Gaudin did not describe the character of the pericline of his var. which is probably synonymous with *C. alpestris*, var. *simplicifolia* Reut. Cat. pl. vasc. Genève 119, 1861. The Rev. H. J. Riddelsdell's plants from cliffs on the coast of Glamorgan were accepted by Marshall (see *Rep. B.E.C.* 231, 1906) as var. *succisaefolia*, of which they have the general characters, differing chiefly in their dwarf size, the stems ranging from 15 to 30 cm. The capituli are solitary or geminate on the unbranched stem, or two or three branches may be developed. The stem-leaves are fewer in number, the capituli either closely covered by the black appendages or, if less covered, then with teeth much longer than in the Scottish plants, and conspicuous by their whitish colour. It is among these Welsh plants that the development of the black appendages completely concealing the green phyllaries reaches its maximum. Although these plants possess the characteristics of the Sutherland plants from which they cannot really be kept apart, yet they strikingly recall *C. alpestris* Heg. et Heer. Besides typical forms of var. *succisaefolia*, both Marshall and Riddelsdell recorded plants intermediate in leaf characters between this and normal *C. Scabiosa*, attributing the same to possible crossing of the forms. Unfortunately, the form of *succisaefolia* from Melness, on the west side of Tongue Bay, is but scantily represented in the herbarium at South Kensington, so it is not quite certain at present whether it is identical with the form from Coalbackie.

A very curious plant with deeply divided leaves and small capituli is apparently an unrecorded hybrid between *C. Scabiosa* L. and *C. nemoralis* Jord. × *C. cantiana* mihi. Stem about 50 cm., simple below, corymbosely branched above. Cauline leaves about 17 cm., sessile, interruptedly pinnatipartite, largest segments 35 mm., lanceolate, entire or serrate, apiculate, smaller segments 4-7 mm., deltoid to oblong-acuminate or apiculate; segments decreasing in size towards the base of leaf, becoming crowded and semiamplexicaul. Rameal leaves numerous, sessile, linear, lobed or toothed only at the base. Branches simple or sparingly branched, the lowest 12-18 cm. long. Capituli inconspicuously radiant, pericline ovoid, yellowish-green and dark-brown, arachnoid, in dried condition not exceeding 2 by 1.5 cm.: appendages brown; disk triangular, about 3 by 2 mm., teeth about 2 mm. long; florets purple. This plant recalls in habit, size, and shape of capitulum, *C. nemoralis* Jord., for which indeed it was gathered as a form with phyllaries remarkably exposed. The interruptedly pinnatipartite leaves, however, are quite unlike any known in the *nigra* group, and can only be attributed to the influence of *C. Scabiosa*, as likewise must a character seen in the lower phyllaries, where the appendages are slightly but distinctly decurrent.—W. Kent—on the hills near Luddesdown. Dr Druce has identified various specimens in his herbarium with var. *melanocephala* Herb. Fl. Ing. 338. *C. melanocephala* was established by Pancic in Fl.

Princ. Serb. (1874) a work that, being in a Slavonic tongue, is inaccessible to me.

In the preparation of this paper I have had placed at my disposal the extensive collections from the herbaria of Dr Druce and Rev. H. J. Riddelsdell, to both of whom I am especially indebted. Messrs C. C. Lacaita, W. R. Sherrin, curator of the South London Botanical Institute, and A. J. Wilmott, have also rendered valuable assistance.

SOME NEW ENGLISH SPECIES OF TARAXACUM.

By H. Dahlstedt.

T. Drucei Dahlst., n. sp.

Folia plurima, laete viridia, tenuia, in pagina superiore saepe passim maculata, utrinque glabra, petiolis angustis et inferiore parte nervi mediani roseo-coloratis, oblonga-lingulata obtusa-obtusiuscula, lobis crebris brevibus latis integris, breve et obtuse dentatis triangularibus (deltoideis) obtusiusculis-subacutis, lobo terminali in foliis exterioribus brevi rotundato-obtuso, in foliis interioribus longiore obtuso.

Scapi plures, basi apiceque leviter colorati, glabri.

Involucrum atroviride parum, sat angustum, basi ovata.

Squamae exteriores adpressae ovatae—anguste ovatae-acuminatae, acumine ± lato obtuso (± fimbriato), conspicue albo-marginatae, interiores lineari-lanceolatae, apice ± latiusculo coloratae.

Calathium c. 70 mm. diametro, sat radians.

Ligulae luteae, marginales extus stria fuscopurpurea ± lata notatae.

Antherae polliniferae.

Stylus luteus, stigmatis fuscis.

Achenium (vix maturum) 3.5 mm. longum, 1 mm. latum, angustum, basin versus sensim attenuatum, p. majore p. inferiore laeve, apice ipso ± breve spinuloso cito in pyramidem 0.5 mm. longum conicam abeunte.

Rostrum 7 mm. longum.

Pappus albus.

A very distinct species, surely belonging to Spectabilia and allied to *T. spectabile* Dt. and *T. unguilobum* Dt.

The plant was gathered by me in April 1914 at Kenmare, Kerry, and it occurred in some plenty in the glen near the house of the late Mr R. M. Barrington at Fassaroe, Bray, Co. Wicklow. I sent it to the Club (see *Report* 152, 1914) as allied to *spectabile*. As will be seen Herr Dahlstedt thinks it sufficiently distinct to warrant its being separated. In September 1921 I gathered it in good flower at Killarney. G. C. DRUCE.

T. JOHNSTONII Dahlst., n. sp.

Folia plurima, firmula, supra obscure viridia, subtus pallidiora, nervo mediano, anguste lanceolata — oblongo-lanceolata, multiloba lobis crebris plerumque valde hamatis et saepe valde retroversis, integris praesertim summis vel in margine superiore ± acute dentatis, interlobiis nullis vel brevibus ± dentatis, lobo terminali ± sagittato in foliis exterioribus plerumque sat parvo, breve acuto, vel mucronato, vulgo integro, in foliis interioribus majore—sat magno interdum ± dentato.

Scapi glabri. basi apiceque leviter colorati.

Involucrum breve, crassum, atroviride, basi ovato-rotundata.

Squamae exteriores ± et saepe late ovatae, ± longe acuminatae, leviter—sat conspicue albido-marginatae, interiores lineari-lanceolatae, angustatae.

Calathium c. 35 mm. diametro.

Ligulae eximie luteae, marginales extus stria ± conspicua purpurea notatae.

Antherae polline carentes.

Stylus cum stigmatibus mere luteus.

Achenium subfulvum, c. 3.25 mm. longum, 1.5 mm. latum, p. majore p. laeve v. breve tuberculatum apice ± longe et acute spinuloso in pyramidem cylindricam v. conico-cylindricam ad 1 mm. longam subito abiens.

Rostrum (7.5-) 8-9 mm. longum.

Pappus albus.

Loc. Orkney :—Links of Merkady, Durness, Mainland, Westland of Walkmill Bay, Orphir; Hall of Tankerness, Saint Andrews (H. H. JOHNSTON).

This species seems also to belong to Spectabilia and to be in some degree related to *T. unguilobum* Dt.

T. FULVIFORME Dahlst., n. sp.

Folia plurima, tenuia, glabra, laete viridia, subtus pallidiora, petiolis angustis et inferiore parto nervi mediani leviter coloratis, lineari-lanceolata—anguste oblonga lobis crebris ± brevibus et ± hamatis, integris vel superioribus in margine superiore ± dentatis, ad angulos et in interlobiis saepe ± fusco-colorata, lobo terminali in foliis exterioribus brevi, triangulari-sagittato mucronato vulgo integro, in foliis interioribus saepius sat magno sagittato marginibus ± convexis integro v. saepius ± dentato, mucronato.

Scapi glabri basi apiceque ± colorati.

Involucrum parvum ± atroviride, basi ovata.

Squamae exteriores adpressae ± late ovatae—ovato-lanceolatae, acuminatae, ± albido-marginatae, paucie sub apice callosae, interiores lineari-lanceolatae, sub apice ± callosae vel breve et obtuse corniculatae.

Calathium sat obscure luteum, 25-30 mm. diametro.

Ligulae angustae, marginalis extus stria obscure purpurea notatae.

Antherae polline carentes.

Stylus cum stigmatibus fuscus.

Achenium ± rubiginosum-testaceum, 3 mm. longum vix 1 mm. latum, inferne laeve vel breve tuberculatum, apice breve et ± late spinulosum, subito in pyramidem conicam, 0.75 mm. longam abiens.

Rostrum 7-7.5 mm. longum.

Pappus albus.

Belongs undoubtedly to Erythrosperma and seems to be related to *T. fulvum* Raunkier.

Near Don Bridge, 1909 [No. 4106]; St Ouen's [Z. 6]; La Moye, Jersey; Oxford [Y. 99]; Bracknell, Berks, 1918 (modif.); Roundstone, Galway, September 1921, G. C. DRUCE; Colley Hill, Surrey (as *erythrospermum*, see *Rep. B.E.C.* 465, 1909), C. E. SALMON; Buffet Wood, Banstead, Surrey, W. A. TODD; Porthkerry, Glamorgan, 1912, H. J. RIDDELSDELL in *Rep. B.E.C.* 267, 1912, and Kniveton, Derby, 1895, W. R. LINTON, both probably this; Easegill rock crevices, Lancs, W. WILSON.

T. OXONIENSE Dahlst., n. sp.

Folia plurima, saturate viridia, subtus pallidiora, glabra, exteriora lineari-lanceolata—lanceolata, profunde lobata, lobis angustis, longis, ± acutis ± patentibus, superioribus superne lacinulis longis cum interlobio angusto ± dentato confluentibus, inferioribus brevioribus sed magis angustis et distantibus, superioribus longioribus minus distantibus, omnibus acutis, interlobiis angustis ± dentatis-lacinulatis, lobo terminali ± hastato in foliis exterioribus sat parvo apiculatis apice obtusiusculo-subacuto, in foliis interioribus majore magis triangulari acuto, lobulis lateralibus valde patentibus et angustis, petiolis angustis sat longis cum nervo mediano ± lucide violascentibus.

Scapi breves, vulgo quam folia breviores ± colorati, glabri-glabriusculi.

Involucrum breve, atroviride, basi rotundato-truncata.

Squamae exteriores breves adpressae ± ovatae—ovato-lanceolatae in apicem obtusum-obtusiusculum contractae v. acuminatae, ± albido-scariosae apicem versus saepe ± violascentes, interiores lineari-lanceolatae ad apicem saepe ± coloratae.

Calathium c. 35 mm. diametro, sat plenum (?).

Ligulae flavae marginales extus stria rubro-purpurea notatae.

Antherae polline carentes.

Stylus et stigma flavescentes.

Achenium haud notum.

Loc. Oxford [X 27]; Quenvais, Jersey, 1910, G. C. DRUCE.

Belongs probably to Erythrosperma but it is necessary to know the fruit before definitely placing it.

Miss I. M. ROPER'S *T. officinale*, var. *obliquum* (see *Rep. B.E.C.* 576, 1916) from Tockington, W. Gloster, seems to belong here, as does, or may, Mr W. A. TODD'S Surrey specimen from Potsden Lacey [N. 384], 1911.

T. TANYLEPIS Dahlst., n. sp.

Folia obscure viridia, subtus pallidiora, sub-glabra—pilosiuscula, ± remote lobata, interlobiis praesertim inferioribus angustis ± dentatis, exteriora lobis brevioribus ± triangularibus lobo terminali brevi triangulari, interiora lobis inferne parvis valde angustis acutis superne ± longis subangustis triangularibus—hamatis acutis inferiori in pagina superiore ± dentatis summis vulgo integris lobo terminali majore—maximo sagittato, integro v. basi inciso breve acuto, petiolis angustis et nervo mediano ± coloratis.

Scapi plures, ± colorati et saepe passim araneosi-pilosi.

Involucrum mediocre, sat angustum basi ± ovata.

Squamae exteriores ± recurvatae-reflexae, inferiores angustissime lineares ± dilutae, caeterae lineares—lineari-lanceolatae in apicem acutum sensim protractae angustissime marginatae, interiores magis obscurae lineares sub apice ± callosae.

Calathium c. 40-45 mm. latum, radians.

Ligulae sat obscure luteae, marginales extus stria obscure violaceae notatae.

Antherae polline carentes.

Stylus luteus.

Stigma luteum.

Achenium adhuc ignotum.

Loc. Sweyn Holm, Orkney (H. H. JOHNSTON).

Belongs to Vulgaria.

T. VALDEDENTATUM Dahlst., n. sp.

Folia laete viridia in interlobiis saepe ± fusco-maculata, subtus pallidiora nervo mediano ± pallido, supra parce subtus paullo crebrius et breve araneoso-pilosa, anguste sat late lanceolata v. interiora ± oblongo-lanceolata, ± longe et abrupte lobata, interlobiis ± longis et angustis v. ± latis, sat crebre—creberrime et saepe longe dentatis, lobis longis saepius ± reflexis et saepe hamatis, inferioribus angustis, intermediis latioribus longe acutatis, apicibus recurvatis-subporrectis, lobis superioribus magis integris, lobo terminali in foliis exterioribus ± triangulari-sagittato v. subhastato ± integro apice ± longo et ± acuto lobulis basalibus acutis et longis in foliis interioribus majore et latiore, saepius ± dentato-denticulato.

Scapi plures p. maxima p. cupreo-violacei, glabri v. parce araneoso-pilosi.

Involucrum mediocre, olivaceo-viride, basi ± ovata.

Squamae exteriores anguste lanceolatae, sat longae, ± anguste albido-marginatae, ± acuminatae, ± reflexae, interiores lineari-lanceolatae, sat acutae apice purpurascentes.

Calathium c. 35-40 mm. latum, parum radians.

Ligulae luteae, sub-angustae, marginales extus stria purpurea sat lata ornatae.

Antherae polliniferae.

Stylus fuscus.

Achenium fusco-olivaceum, c. 3 mm. longum, 1 mm. latum in pyramidem 1 mm. longum abrupte abiens, p. majore p. breve, summo apice breve et sat late spinulosum.

Rostrum 7-8 mm. longum.

Pappus albus.

Loc. Wimbledon and near Malden, Surrey, W. A. Todd; Frilford, Berks, 1912, G. C. Druce.

Belongs to Vulgaria.

T. naeviferum Dahlst., n. sp.

Folia plurima, supra laete viridia, subtus pallidiora saepe in interlobiis, et passim secus nervum dorsalem ± laeto violascentem ± fusco-maculata, supra glabra, subtus praesertim in nervo dorsali ± araneoso-pilosa, oblongo-lanceolata—lanceolata, crebre lobata, lobis ± triangularibus, inferioribus longioribus et angustioribus, in utroque margine ± et saepe valde dentata, superioribus latioribus minus dentatis v. integris, saepe subhamatis, lobo terminali in foliis exterioribus brevi, ± triangulari-sagittato obtusiusculo-subacuto integro, in foliis interioribus sat magno ± sagittato—hastato-sagittato p. majore inf. parto ± crebre et irregulariter dentato.

Scapi plures, inferne ± rubro-violacei, superne ± viridescentes v. apice magis coloratae, sparsim v. saepius sub involucro ± araneoso-pilosi.

Involucrum mediocre, sat latum, basi ± truncato-ovata, atroviride.

Squamae exteriores intimae et extimae ± lanceolatae, intermedia ± late lanceolatae—ovato-lanceolatae, sensim acutatae, in pagina exteriore atrovirides, in interiore ± atro-violaceae, ± patenter recurvatae, interiores angustae, lanceolatae, acutae.

Calathium c. 45-50 mm. diametro, ± radians.

Ligulae luteae, ± angustae (subcanaliculatae ?), marginales extus stria lata purpurea notatae.

Antherae polliniferae.

Stylus fuscus.

Achenium ± olivaceum, angustum, 3.75 mm. longum, c. 0.5 mm. latum in pyramidem 0.5 mm. longum sensim abiens, supra medium latissimum, basin versus sensim angustatum, pro majore p. inferiore breve, superne breve spinulosum.

Rostrum 7-7.5 mm. longum.

Pappus albus.

Loc. Wimbledon, W. A. Todd.

Belongs to Vulgaria.

T. SUBUNDULATUM Dahlst., n. sp.

Folia plurima, laete viridia, exteriora angusta, linearia—lineari-lanceolata lobis brevibus angustis v. superioribus latioribus, acutis, integris vulgo ± patentibus (apicibus saepe subporrectis), interlobiis ± angustis dentatis sejunctis, lobo terminali brevi + dentato, intermedia brevioribus—longioribus, magis crebris integris v. ± dentatis, interlobiis brevioribus + dentatis, intima lobis latioribus ± dentatis, superioribus crebrioribus et saepe latissimis + integris, lobo terminali lato magno obovato-sagittato subintegro—grosse dentato, lobulis basalibus latis brevibus.

Scapi plures basi apiceque leviter colorati.

Involucrum mediocre, obscure olivaceo-viride, basi ovata.

Squamae exteriores primo erectae-patentes sub antheri patentes v. ± recurvatae, anguste ovatae—ovato-lanceolatae, obtusae—obtusiusculae in pagina interiore saepe ± violascentes, haud marginatae, interiores lineari-lanceolatae apice contracto obtusiusculae—obtusae.

Calathium c. 45 mm. latum, sat plenum.

Ligulae obscure luteae, sat latae, marginales extus stria obscure violacea notatae.

Antherae polliniferae.

Stylus et stigma fuscescentes.

Achenium badio-olivaceum, c. 3.5 mm. longum, 1 mm. latum, basi angusta sublaeve v. ± tuberculatum, apice versus latius breve et sat late spinulosum abrupte in pyramidem c. 0.5 mm. longam conicam abiens.

Rostrum 9-11 mm. longum.

Pappus albus.

Loc. Hailey, Oxon, G. C. Druce.

Belongs to Vulgaria and is related to *T. undulatum* Lindb. f.

T. latispina Dahlst., n. sp.

Folia plurima, ut videtur laete viridia, subtus pallidiora, exteriora et intermedia v. omnia ± angusta, lanceolato-linearia lobis subhamatis v. superne hamatis, angustis—sat latis, acutis, integres v. interdum in margine superiore denticulatis praedita, interlobiis inferne sat longis, angustis, superne latioribus et brevioribus sparsim dentatis sejunctis, lobo terminali ± sagittato brevius—longius mucronato, subglabra v. praesertim in nervo dorsali ± rubro-violascente saepe parce araneoso-pilosa, petiolis ± coloratis, interiora latiora ± oblonga lobis latioribus et superne latioribus, paucioribus, inferioribus ± denticulatis, interlobiis brevioribus, lobo terminali magno, ± sagittato, vulgo integro, marginibus valde convexis, ± obtuso—obtusiusculo breve mucronato, lobulis basalibus saepe valde retroversiis.

Scapi basi apiceque ± colorati parce v. praesertim sub involucro densius araneoso-pilosi.

Involucrum sat magnum, olivaceo-viride basi ovata.

Squamae exteriores mediocriter longae ± late anguste ovato-lanceolatae—lanceolatae, extus ± obscure olivaceo-virides, intus ± violascentes, sensim acutatae, interiores ± lineari-lanceolatae, acutae—acutiusculae.

Calathium 35-40 mm. diametro.

Ligulae luteae, sat angustae, marginales extus stria purpurea notatae.

Antherae polliniferae.

Stylus fuscus.

Achenium badio-rufescens, c. 3 mm. longum, 1 mm. latum inferne breve et sat dense tuberculatum superne late spinulosum, in pyramidem brevissimum, vix conspicuam cito abiens.

Rostrum c. 10 mm. longum.

Pappus albus.

Loc. Oxford Park [Y. 51, 46]; Hailey, Oxon [Y. 103, 105]; Princes Risborough, Bucks [Y. 44], G. C. Druce.

Belongs to Vulgaria. Seems to be allied to *T. mucronatum* Lindb. f.

THE WANDERINGS OF THE GROUNDSEL.

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The Groundsel, *Senecio vulgaris*, is commonly regarded as only one species; that single species, however, includes a miscellaneous group of about one hundred microspecies, and for the purpose of this lecture the name "Groundsel" is extended beyond that familiar canary food to all its relatives which are included in the genus *Senecio*. Taking "Groundsel" as synonymous with *Senecio*, we deal, not with one species, but with about 2,500 species, ranging over all the habitable surface of the earth, and with a type which may be regarded as older than the Alps and Himalayas.

At a period which is variously estimated as from 4 millions to 40 millions of years ago none of the existing high mountain ranges were in existence. As the earth began to emerge from what is known as the Cretaceous Period, the western parts of South America were flat, and the region of the Amazons was covered, as it is to-day, by a very mixed, dense forest. The few herbaceous and semi-shrubby plants which grew in such forests were epiphytes or climbers, and amongst the semi-shrubby climbers were the ancestors of the groundsel. This ancestral type still lingers in the same region, as the genera *Siphocampylus* and *Centropogon*, which are relatives of the little blue *Lobelia* of herbaceous borders and window-boxes.

About this time a great uplifting movement began which ultimately gave rise to the Andes and, later on, to the Rocky Mountains. This new range of mountains abutting on the tropical forests of the Amazons presented an entirely new habitat, which was open to colonisation by such of the forest species as could survive the change from a rich, warm, moist environment to the more or less arid conditions of the mountain side.

The Lobelioid climbers were amongst the early colonists; descending the trees, or rather failing to find trees upon which to climb, they first became scramblers on the low bushes of the forest edge. Then as they spread year by year up the hillside beyond the tree-limit to beyond the limit for bushes, they became ground-growing scramblers. The severe conditions reacted upon these pioneers, producing stunted growth and general crowding together of all parts of the plant. The stems being short, the leaves were crowded; the flower-stalks being short or altogether absent the flowers became crowded. The general tendencies towards the production of such characters as hairy appendages to the style branches, tails and apical appendages to the anthers, a few ovules or only one ovule in each ovary, etc., became expressed more fully in the flowers, and since these were already grouped in dense clusters, something very like the flower-head of a Composite was the result.

The young flowers being protected by the green leaves surrounding the flower-head, the calyx became useless, and disappeared at an early stage. The windy arid conditions on the hillside caused the development of hairs on most parts of the plants, and the hairs on the top of the young fruits grew longer than those lower down on the fruit. In this way there was formed the *pappus*, which proved very useful. The hairs, developed in response to the dry windy conditions, when organised as a fringe on the top of the fruit, became more than protective. They caught the wind, more or less like an expanded umbrella; and because they did *not* form an unbroken surface they were much more effective than a purely sail-like mechanism. These hairs, now called the pappus, made it possible for even a slight breeze to blow the light fruits to considerable distances.

The groundsel, therefore, may be said to have been originated by the uplifting of the Andes, and it proved eminently suited for the arid windy mountainous regions, where it still flourishes in great profusion. *Senecio* was, in fact, developed by the mountains with the mountains for the mountains. It arose by the modification of certain Amazonian Lobelioids towards the end of the Cretaceous Period, and started out on its many and long wanderings with an equipment of structure and constitution which was pre-eminently suited for mountaineering. As a natural consequence it usually took the " high " road in its travels.

Being spread by the wind both up and down the mountain slopes it reached to snow-level on the one hand and to the bush country around the forests on the other, and it naturally underwent corresponding changes. Near the snow-level it became even more densely compact and much more hairy, giving rise to the edelweiss and cudweed type. On the lower slopes, which were both warmer and more moist, the hairs of the pappus ceased to be developed as such and underwent various changes into awns and barbs which proved to be advantageous for dispersal by forest animals. Thus the groundsel gave rise to the bur-marigold and sunflower type. With these two South American progeny it then moved along the Andes southwards to Tierra del Fuego, and northwards to where the Rockies were beginning to appear in what are now the United States and Mexico.

On reaching the southern part of the Rockies *Senecio* developed, in part, long appendages to the style branches and became slightly modified in other ways, giving rise to the goldenrod and Michaelmas daisy type. By this time the Eocene Period was well-advanced and mountain ranges were beginning to appear in Asia and around the Mediterranean end of the Great Central Sea. The Yablonoi, Altai and Thian Shan ranges and the mountains of Afghanistan, Persia and Asia Minor formed one path stretching from close to the northern end of the Rockies to the Mediterranean region. While the Yablonoi, Khin gan, Sin-Ling and Himalayan ranges formed another similar path through China and Northern India to Asia Minor. Spurs from the latter path led through the Malay Peninsula and Sumatra to Australia, and also *via* the Philippines and New Guinea to the island continent.

Our wandering groundsel, showing its original liking for the "high" road, took both the main Asiatic paths, after coming north along the Rockies and crossing the Alaska-Siberian bridge. The wide, wet or frozen plains in the north were not congenial and these far-stretching paths were not colonized to any great extent, but the routes taken can still be traced by certain species. *Senecio altaicus*, for example, occurs along the first path from Siberia to Turkestan; *S. Ligularia* occurs along the second path.

The Mediterranean region, the next halting place, formed at this time the eastern end of the Great Central Sea which, by gradual draining and drying up in succeeding ages, formed at one end the semi-desert regions around Mesopotamia and Northern Africa, and at the other end the similarly arid Mexican plains. On reaching the warm woodlands, which at the end of the Eocene covered the many eastern islands of this primeval sea, our changeful groundsel in part again lost its pappus and by a few other slight changes developed the corn marigold type (*Chrysanthemum* and its allies chamomile and yarrow). Other colonies of groundsel in the same region about the same time developed by mutation a split down the back of the corolla, which with some slight accompanying changes gave rise to the lettuce and dandelion types.

The conditions in this early Mediterranean zone were so different from those of the original home and of the paths of migration of the groundsel that, within the next geological period (Oligocene) still another set of changes took effect on the colonist giving rise to the elecampane and golden samphire type. This offshoot arose by an increase in the number of ray florets on account of the rich soil and favourable conditions for luxuriant growth ; but very soon, geologically speaking, this same type developed into thistles by reason of the considerable drying up of the eastern end of the Great Central Sea and the resulting hot dry climate.

Meanwhile the descendants of the groundsel in its original home, multiplying, spreading and undergoing various slight changes in response to new and more favourable conditions, gave rise to other new types such as *Trixis* and *Gerbera* in Brazil. In the succeeding geological period (Miocene) the same Amazonian region was the scene of the origin of several still newer types, such as *Liabum*, *Vernonia* and hemp agrimony (*Eupatorium*). About the same time in Mexico the Michaëlmas daisy type gave rise to the true daisy (*Bellis*) and some of the Mexican groundsels developed into the French marigold type (*Tagetes*), mainly as the result of the first stages in the drying-up of the western end of the Great Central Sea.

Before the Pliocene period was well begun an extensive migration took place southwards along the mountains of eastern Africa : not only the groundsels but the golden samphire and edelweiss types took part in this movement. South Africa was at this date beginning to become largely a semi-desert region, and such conditions had their inevitable effects on the last type, which originally came from near the zones of eternal snow on the Andes. In South Africa it gave rise to the " everlasting " type (*Helichrysum*). A little later on in the wooded regions which still occurred along the rivers, some of the groundsels lost their pappus and developed other means of dispersal, just as had happened before under such conditions in Brazil, Mexico and the Mediterranean. In South Africa this change was in some cases accompanied by the sterilisation of the ovaries of the central florets of the flower-head; and the products were first the South African marigold (*Ursinia*) and afterwards the ordinary marigold (*Calendula*).

Towards the end of the Pliocene period the wet, cold conditions obtaining on the northern plains of Asia yielded a belated derivative of the groundsel, the butter-bur and coltsfoot type, where the flowers are developed underground in the autumn and emerge only at blooming time in the spring.

An interesting case of convergent evolution occurred quite recently (Middle Pliocene, about a million years ago) in South Africa. There the colonists descended from the "everlasting" type on the one hand and from the golden samphire type on the other became so extremely alike that their progeny are classed together in the same small division of a tribe of the main Compositae family.

Perhaps the most remarkable point of all is this—the original groundsel type was equipped with such an adaptable constitution, such an efficient dispersal mechanism and such a strong vitality that it survives to the present day in all the regions to which it wandered. It flourishes amongst its numerous progeny, sparsely along some of the northern paths of migration, abundantly wherever conditions have been sufficiently favourable to allow of the development of that great number of individuals which often accompanies the origin of new types. Its 2,500 species exhibit every variety of herbaceous, shrubby and arboreal growth, but with this amazing range of vegetative form the structure of the flower-head and of the individual flowers remains constant even in microscopic details.

Such is the story of how the Groundsel wandered from its Andine home all over the surface of the earth, giving rise to numerous colonies, each of which developed its own peculiar characteristics, so that in time the highest and largest family of flowering plants, the Compositae with its 2,500 species, came into being. The story, here told very briefly and imperfectly, is as worthy of an epic as the wanderings of Ulysses or the travels of Marco Polo: in fact, all the wanderings of primeval men are dwarfed into hurried events of recent and local interest in comparison with these journeys of the Groundsel in which about sixty million square miles were traversed in some forty million years.

BOTANISING IN NORWAY.

BY

G. CLARIDGE DRUCE.

Five weeks were spent in the summer in Norway, and as many of our members wished to have a slight sketch of the route followed and the species met with I submit the following: premising that as it was my first visit to Scandinavia, I felt that I had to get acquainted with the country and its customs before making a definite study of its flora. Prebendary Burdon and T. Churchill were my companions. We decided not to take any of the cruises which would too much limit us to the coast but to take our tickets from place to place so as to be quite untrammelled, a slightly more expensive method, but having great advantages. We travelled from Hull to Christiania in an excellent boat of the Ellerman-Wilson Line. Travellers must have passports and visas and we recommend them to obtain the former direct from the Foreign Office and the latter from the respective Consulates. Expense and time will thus be saved. Possibly before next year these vexatious restrictions will be removed. Bennett's, the tourist agents at Christiania, are obliging, and they will supply tickets for any kind of route. It is well to secure a ticket for a place when making a long journey as the trains are crowded. The train meals are good. Norway is a " dry " place so far as spirits go, so it is well to take a brandy flask in case of illness. Lager beer and a good dark brown ale are to be obtained, but the ale is rather gouty, especially when it is combined with a richer diet than ordinary British food. We reached Christiania on Monday morning. On that day the museums are closed so we spent a delightful afternoon on the fiords winding in and out among the islands, seeing *Anthemis tinctoria*, *Lysimachia thyrsiflora* and other interesting species on the banks, and *Potamogeton filiformis* in the water. We started early the next morning for a long railway journey to the Dovrefeld, through beautiful and varied country. We reached Hjerkin at dusk, but not too late to see *Carex atrofusca* growing in turf on the railway embankment, and *Astragalus alpinus* in plenty by the roadside. One ought to have said we were entirely ignorant of the language, and that the only botanical book we had with us was Lindman's excellent *Sveriges Flora*, in Swedish. The hotel is about a mile from the station, and is situated in a large open stretch of upland country, at an altitude of 3140 feet. Like most of the Norge hotels this one is built chiefly of timber, and is scrupulously clean. The meals are plentiful. The chief meal is taken about 2 p.m., supper being at 8 and breakfast 8.30-9. Milk is supplied in large jugs which are put on the table for the guests who drink copiously of it with their meals. Butter of good quality and eggs are in plenty. The meat is often stewed, and there is an abundance of dried salmon, sausage, anchovies, sardines, brawn, and other cold meats. Fish is often served cold, but is beaten to a pulp, passed through a sieve, and mixed with a certain portion of potato flour and then made into a shape which is not unusually that of a fish. It is also served hot and is palatable and digestible. It makes an excellent dish. Fruit juice is supplied with milk puddings and sometimes there are stewed blaeberries or, rarely, the excellent cloudberries. Strawberries were often given as a dessert. In fact for gouty people the diet is perhaps a trifle too good. All this is by the way, but it was a pleasurable surprise to find, instead of the rough plenty I had been led to expect, the cleanest of hotels, comfortable beds, and plenty of excellent well cooked food. Need one wonder, therefore, that we gave up for this year the idea of visiting Sweden and Denmark, which was our original intention, and determined to spend the whole of the time in Norway. This resolution was not made until we reached Trondjhem, or we should have spent four or five days more on the Dovrefeld, and then might have climbed the slopes of Snehatten, a mica-slate mountain 7770 feet high, which is visible from Hjerkin. As it was, our time was all too short in this rich botanising centre. The doorsteps of the hotel had *Poa glauca* growing out of them. Close by in the turf was *Agropyron violaceum*, which seems identical with the Ben Lawers plant. We walked along the old road leading to Kongsvold and climbed the adjacent hill, 4500 feet high. It was a botanical garden. The conspicuous plant was *Astragalus alpinus*, but the British rarities we saw on our way included *Thalictrum alpinum*. *Arabis alpina*. *Draba incana*. *D. rupestris* (but a larger plant than the Breadalbane one). *Silene acaulis*. *Lychnis alpina* (also larger than the Forfarshire plant), *Cerastium alpinum* in several forms, *C. nigrescens*, *C. ceras-*

toides, *Sagina saginoides*, but although *procumbens* was there I saw no *S. scotica*—another argument in favour of *scotica* being distinct —*Arenaria uliginosa*, often luxuriant, *Geranium sylvaticum*, plentiful on the moorland, *Potentilla Sibbaldi*, *P. Crantzii*, *Rubus Chamaemorus*, *Dryas*, *Epilobium alpinum*, *E. alsinifolium*, and *Saxifraga aizoides*, with orange-brown coloured flowers. *Linnaea* and *Cornus suecica* were abundant in the wooded parts with *Unifolium* (*Maianthemum*) *Bifolium*. The Composites included *Erigeron borealis* and *Gnaphalium norvegicum*, which seems a good species. It is very rare in Britain as I have only seen it from Lochnagar, Ben Wyvis and Corrie Li in East Ross. In Norway it is widely spread and scattered. We also saw *Antennaria dioica*, var. *rosea* and var. *pedicellata*, *Saussurea*, *Hieracium alpinum*, and other Hawkweeds in great variety. Other plants seen included *Bartsia alpina*, *Oxycoccus quadripetala* and *microcarpa* with *Andromeda*, and growing in the bogs *Tofieldia*, *Carex pauciflora*, *C. magellanica* (much of our British '*magellanica*' is not the true plant which is extremely rare in Britain), *C. limosa*, *C. rariflora*, *Kobresia*, *C. lagopina*, *C. polygama*, *C. capillaris*, *Juncus alpinus* and *Deyeuxia neglecta*. On our moorland road, which we have temporarily left, we saw *Gentiana nivalis* in great beauty and *Menziesia caerulea* in abundance—the latter a frequent species in Norway. Here, too, we saw the Norwegian *Primula scotica*, but it is not identical with the Caithness plant. *Veronica alpina* was common and *V. saxatilis* in great beauty. *Euphrasia borealis* was frequent. The *Bursa pastoris* there is *brevisiliqua* Almq. In the moorland swamps grew immense quantities of *Betula nana*, and its hybrid was also frequent. The willows included a rare hybrid, *Salix herbacea* × *lapponum*, *S. lanata*, *S. Myrsinites*, *S. reticulata*, *S. herbacea* and *S. lapponum*. Of the Rushes *Juncus castaneus*, *J. trifidus*, *J. triglumis* and *J. filiformis* were common. In addition to the sedges mentioned *C. atrofusca* was abundant, and there was also *C. atrata*, *C. alpina*, *C. pauciflora*, *C. vaginata* and *C. rigida*. *Eriophorum alpinum* grew in the moorland swamps. *Phleum alpinum*, *Poa irrigata*, *P. pratensis* in several forms, *P. glauca*, *P. alpina*, *Deschampsia alpina*, *D. cæspitosa*, var. *brevifolia* were abundant and *P. laxa* local. *Poa palustris* grew near the hotel where *Asperugo procumbens* was adventive. *Equisetum pratense*, *E. umbrosum* and

Lycopodium annotinum were also noted. Near Kongsvold, and in the Druva ravine, we saw *Saxifraga cernua*, *S. caespitosa* (again not like the Westerness plant), *Carex rupestris*, and a rich variety of plants. Of the non-British species *Aconitum septentrionale*, with its dull purple flowers, was conspicuous in the uplands, and the feathery heads (now over flower) of *Anemone vernalis*. A glorious sight was a pasture full of *Papaver radicatum* in all tints from deep orange to pure white. It was worth the journey in the fresh, keen, mountain air to see its beauty, and amid such surroundings, the rushing river, the sombre ravine and the distant snow fields. *Draba magellanica* was local and *Viola biflora* rare. In the bushy places grew the yellow flowered *Astragalus frigidus* and the violet-blue flowered *A. oroboides*. An extraordinary looking species is *Wahlbergella* (or *Lychnis*) *apetala* with its large inflated calyx. The small, white-flowered *Arenaria scandinavica* was local, as was *Stellaria borealis*, but *Silene rupestris* grew at Kongsvold and is a common feature throughout Norway. *Saxifraga adscendens* (which some botanists put under *tridactylites*, but the two plants are abundantly distinct) and another plant near our *S. nivalis*, *S. tenuifolia*, *Sedum annuum*, *Erigeron uniflorus*, and *Artemisia norvegica*, the latter a very distinct species, were all new to us, as was *Antennaria alpina*. On the hill-side about 4500 feet we had the delight to meet with *Cassiope hypnoides* which, as its name suggests, has a moss-like foliage, with short stalked, pure white, globular flowers like pearls. To this we paid our devotions. It grew with *Menziesia*. The Gentians included *G. tenella*, *G. islandica* and *G. suecica*. Neither of the two latter is our Shetland plant. *Androsace septentrionalis* was local. Two species of *Pedicularis* with pale yellowish flowers were obtained. In the lower woods grew *Alnus incana*, a very frequent but small tree in Norway, *Salix glauca* and *S. hastata*. Orchids were few but *Habenaria obtusata* was new to us and *H. Gymnadenia*, *H. viridis* and *H. bifolia* (a small form) occurred. The Sedges included the very distinct *Carex capitata*, *C. microglochin* (which ought to be found in Britain), and the very curious *C. parallela*. *C. brunnescens* (a near ally of *canescens*) is common in sub-alpine places in Norway, and on the Dovrefeld we first made acquaintance with the true *C. caespitosa* L. which is densely tufted, has a narrow, but very rigid, flowering spike with spikelets small for the size of the plant. It is widely spread in Norway. *Trisetum subspicatum*, a handsome and peculiar grass, at first suggesting a *Koeleria*, was local. Here, too, we made our acquaintance with *Epilobium lactiflorum* (a very distinct species not in the least like *alpinum*) and *E. dahuricum*, which does not seem identical with our British *E. palustre*, var. *lineare*. In an upland wood, at about 3800 feet, a small plant like a deformed *Montia* attracted attention and for some time I was puzzled. At last it dawned upon me that it was the Polygonaceous plant *Koenigia islandica* but I never saw it elsewhere in Norway. *Eriophorum Scheuchzeri* adorned the bogs. This list, and it is by no means an exhaustive one, will give some idea of the riches of the Dovrefeld and one can cordially recommend it to our members. We then went to Trondhjem, arriving after 12 at night, where we were luxuriously housed at the Phoenix Hotel. A delightfully cooked dinner was enjoyed, and there was a small but excellent and not too noisy orchestra. So much for roughing it in the north! The city is clean and picturesque; there are good shops; and a general air of prosperity. We made a pleasing motor-run to see the two great waterfalls of the Nid called the Lerfossen, about 5 miles away, and beautiful they were. The adjacent wood has *Struthiopteris* and a striking form of *Carex flava* with large long-beaked fruits. *Heracleum sibiricum* grew near the splendid Cathedral.

We also went up a hill on the other side of the city to the Fjeldsaeter from which most splendid views of the southern snow peaks and the distant Dovrefeld are obtained. We saw Skistuen and the ski station is near. There is some good, boggy and heathy ground on the way up where we were enabled to see the true *Orchis maculata* (*ericetorum*), identical with our Scottish plant. *Eriophorum alpinum* was also observed as well as *Unifolium*, *Viola palustris* and *Carex binervis* in what seemed to be a new locality. *Pyrus fennica* also grew in the woods. On the rocks at the summit we saw a curious looking, Saxifrage-like plant. It is the *Diapensia lapponica* which we were glad to obtain, although the corolla had fallen.

Another day was occupied in visiting some very picturesque lakes near Jondsvandet. In the boggy ground there grew *Carex diandra*, *C. limosa*, *C. polygama*, *C. flava*, var. *œdocarpa*, *C. canescens* and *Deyeuxia stricta*; in the lakes, *Nymphaea pumila*, *Sparganium affine*; in wet woods *Lycopodium annotinum* and *Mulgedium* *alpinum* in fine growth, and in thickets a pretty grass, *Calamagrostis purpurea*, *Agrostis alba*, var. *gigantea*, and *Melampyrum pratense*, var. *hians* Druce. The Norwegian Bracken is different from ours, their plant being glabrous, with flatter and larger divisions of the frond. It is of a more lucent green and it seems well worthy of sub-specific rank. It is the true *Pteridium aquilinum* Kuhn, our plant is the var. *lanuginosum* (Bory). I saw none of the British form in Norway. Mr Burdon thought the two were specifically distinct. The north-west of Scotland should be searched for the glabrous plant. A walk was made on the northern side of the fiord where on the rocky cliffs *Epilobium collinum* was common. It is widely distributed in Norway and has quite a different facies from *montanum*, its nearest ally. *Ajuga pyramidalis* was seen, but over flower. It is quite distinct from *reptans* and *genevensis*. The mystery is how they came to be confused.

From Trondjhem we took a small steamer to Molde. Leaving in the evening we reached Molde about noon, after a pleasant voyage. After lunch we had a pleasant stroll round the bright looking town, and climbed a hill to see the glorious view of the fiord. Then we embarked and had a most pleasing journey through the fiord to Aandalsness. We drove about two miles further on in order to stay at the beautifully situated Park Hotel, where the hostess was unwearied in her endeavours to make us comfortable. The place would be very pleasant for a prolonged stay. The table was a most hospitable one, but we were called away at dinner to see an alpine glow which turned the magnificent Romsdal Horn into a ruby cone and the patches of snow on the hills caught the fire. Beyond Romsdal is the still more lofty Vengetinder. My companion told me that one of the rarest British plants grew outside the tennis court and there, in a deep gully, grew a splendid colony of *Mulgedium*. Not to be outdone I took him just across the road to some boulders on which grew splendid tufts of *Asplenium septentrionale* and *Woodsia ilvensis*. On the mountain screes grew rosettes of *Saxifraga Cotyledon* of which flowering specimens grew on the vertical cliffs. The excavation for a contemplated railway yielded quite naturalised *Bromus arvensis* and *B. inermis* in luxuriant growth. Farther up the valley we found *Calamagrostis arundinacea* and *C. Epigeios*. The side of the fiord afforded *Scirpus rufus* and *uniglumis* and the ditches *Utricularia minor*. We traversed a lateral valley in order to climb to the snow but the walk yielded little. But the view of the Romsdal Horn and its attendant hills was magnificent. From Aandalsness we took a boat to Vestnaes, and then motored through a Scotch moor-like country to Søholt pleasantly situate and with a good hotel. The botany here was quite good. In the pastures grew the orange-flowered *Arnica*, making a goodly show. We had a pleasant walk through the country bordering the fiord and found *Alchemilla subcrenata*, *Melampyrum silvaticum*, *Habenaria bifolia*, and *Polygonatum verticillatum*, and by the shore *Calamagrostis purpurea*, *Carex salina*, var. *cuspidata*, and *C. norvegica*, new to us.

From Søholt it was a delightful sea journey through the Sunelv Fiord and thence up the grand Geiranger Fiord, with its stupendous cliffs and numerous waterfalls, to Merok which we reached at dusk. We decided to stay at the Utsigen hotel which was two miles away and over a thousand feet in altitude. The extraordinary road, with its hair-pin bends, had to be ascended in the darkness with only the light from the motor's searchlights. It made it look appallingly dangerous. Below us in the magnificent Geiranger Fiord lay two of the pleasure-trip steamers brilliantly lighted as the passengers were having a dance. From our bedrooms, which opened on to a balcony, we could hear the strains of the band and what was more pleasant, the roar of a waterfall, which was about a quarter of a mile away, which sounded loud at times and low at times as the wind rose or fell. I think the view which we obtained in the early morning from this place is to be reckoned among the great views of the world.

We found on the precipitous cliffs below the hotel splendid *Saxifraga Cotyledon* with sprays of flowers a foot long. It was used as a table decoration. There, too, we had *Mulgedium* and *Silene rupestris* was in evidence on dry rocks. A most lovely walk up the pass gave us fine examples of *Gnaphalium norvegicum*, *Cornus suecica* in magnificent fruit, and *Unifolium* in good flower owing to the retardation of its flowering season by the higher altitude. *Impatiens Noli-tangere*, *Asplenium septentrionale* and *Woodsia ilvensis* were common. A couple of days passed all too soon and then we motored from Merok to Grotli. Formerly this took twelve hours in the old carriages. Now there is a good road. As one ascends towards the head of the gorge the outlet seems blocked, but by a daring bit of engineering the road climbs by a succession of hair-pin bends to the top of the pass, 3500 feet in altitude, the water-shed of the Gudbrandsdal and the western fiords, where one is close to the snow. Where it had melted the tiny blue flowers of *Veronica alpina* appeared with *Epilobium alpinum* and other small alpines. From the top of the pass to Grotli the scenery is bare and bleak in the extreme. A lake was passed on which were floating masses of ice. The hotel at Grotli is well situated in this dreary expanse. Formerly there was an encampment of Lapps near by, but they have gone north. However, there are many reindeer on the hills, a relic of the Lapps, but we only found an antler or two, nor did we meet with bears although *Arctostaphylos Uva-ursi* and *alpina* were plentiful. The hotel stands in an alpine situation and within a stone's throw from the terrace might be found *Gnaphalium norvegicum*, *G. supinum*, extremely fine *Cerastium Cerastoides*, *C. nigrescens*, *C. alpinum*, *Epilobium lactiflorum*, *Carex lagopina*, extraordinarily plentiful: *C. atrata*, *C. vaginata*, *C. saxatilis*, *C. brunnescens*, *Poa laxa*, *Hieracium alpinum*, *Sagina Saginoides*, *Agrostis borealis*, *Juncus castaneus*, *J. triglumis*, *J. alpinus*, *J. filiformis* and *Luzula spicata*. We climbed the next day to the ice and found much of interest including *Melampyrum pratense*, var. *purpureum*. The adjacent lakes, affording good fishing, were grand and so were the mosquitoes.

From Grotli a long motor drive to Hjelle was made which took us through ice and snow with fine hills on each side. Here, too, was a lake with floating masses of ice. Driving sleet and a dense mist did much to mar the pleasure of the day. *Ranunculus glacialis* showed its reddish-pink flowers through the gloom. We descended to Hjelle by another series of hair-pin bends where one has to trust to the driver's skill, and wonderful drivers they are. The car seems to aim at a stone post; there is nothing in the way of a wall as a protection to the road, and when within a couple of feet of destruction the car is swung round in an appalling swerve, and you are on to the next bend before you can say 'Jack Robinson!' At any rate we safely reached Videsaeter and Hjelle after passing through a most wonderful gorge with masses of the snowy blossoms of *Saxifraga Cotyledon*. We went by a boat down the Strynsvand one of the most lovely of lakes, to Mindresunde and then by motor-boat to Visnæs. Then we motored to the excellent Hotel Alexandra at Loen where we had most delightful rooms looking up to the glaciers in the stupendous valleys near. The motor road, cut out of the cliff, from 50 to 100 feet above the fiord, was perhaps as dangerous as, if less exciting than, the descent of the pass, but it was extremely beautiful. Next day we varied by having the old-fashioned and now fast disappearing Stolkjarre, a small vehicle holding two in front, while the driver stands on a bar behind and directs the pretty fawn-coloured steed. Our object was to climb to the glacier about 10 miles away so we drove to Vassenden, took the steamer down the Loenvand to the end of the lake, drove for some distance and then climbed the rough mountain-side to the ice of the glacier called Kjendalsbrae. On the moraine we found *Arabis petraea*. Olden, with its curious church, was also visited and there we found *Limosella* in plenty.

Our next journey was from Loen by boat to Sandene up the Gloppenfiord where we were most comfortably housed. The hotel has electric heating, with a cuisine which left nothing to be desired. The view from the hotel over the upper portion of the fiord with the snow-clad hills well wooded at the base was most charming. Our first expedition was to see the great waterfall of the Eidsvoss from which the spray is carried for some distance. Washed by this spray grows *Ranunculus reptans*, identical with the Loch Leven plant. We walked round the head of the fiord and on the muddy shore found *Limosella aquatica* and growing with it *Tillaea aquatica* like the Adel specimens. Here, too, was what Prof. Holmboe named *Cochlearia anglica*. The weather here was rainy but an exploration along the fiord afforded *Ligusticum scoticum* (common) and, on a rocky bank, *Allium oleraceum*. The daughter of Mr Ryg, hotel-keeper, had made a collection of local plants, but there was little in it that we had not seen. We cannot too highly speak of the hotel.

We took a motor from Sandene for the long journey to Vadheim on the north side of the Sognefiord. We passed through pine-woods, and then by a road cut out of the cliff along the lake side and through gloomy mountain gorges where on the rock-fall screes grew immense quantities of the Parsley Fern, recalling the screes of Ben Nevis. Then we reached Skej, then a long lake, the Jølstervand, and a fine waterfall, the Huldrefos, and then Forde with its rushing river, and after a delightful run reached Vadheim where we embarked on the boat for Bergen. The passage was propitious and we reached Bergen without anxiety but had a wrestle to get rooms at the imposing looking Hotel Norge. We met with the inevitable *Matricaria suaveolens* on waste ground and saw the sights of the pleasantly situated but extremely rainy city —the Portree of Norway. We soon made arrangements to take the romantic railway as far as Trengereid and then motored to Norheimsund, a most exciting journey as the road was cut out of a cliff which formed the eastern side of a great defile. It had no protective wall so that one looked down slopes of appalling steepness a thousand feet or more to the stream below. The road occasionally went through a tunnel. The rocks showed *Saxifraga Cotyledon* and the less steep slopes in places were covered with the graceful *Struthiopteris*. That day before reaching Norheimsund we passed three splendid falls. Norheimsund is a very attractive place. Despite a shower we went to the Øfsthusfos, behind which is a tiny path which takes one between the fall and the rock over which it plunges. Near the village we saw, on one group of rocks, *Scleranthus perennis*, with *Woodsia*, *Asplenium septentrionale*, *Sedum annuum* and, near by, were *Centaurea Jacea*, *Arenaria trinervia* with smaller leaves and more floriferous than our own, *Hieracium Auricula* and *H. scandinavicum*.

From Norheimsund we took a steamer to Utne on the fiord of that name, whence four other fiords radiate to the four points of the compass. There we took the boat up to Odda on the Sorfiord, where we had excellent quarters in very beautiful surroundings. The great carbide works near are now closed so the smoke from them which once hid the beauty is no longer a serious annoyance. Odda is much indebted to my old friend, the Principal of Hertford, who spent many summers there. We made an excursion to the great glacier, the Buarbrae, only 1000 feet above the fiord, and here I saw *Potentilla norvegica* and robust *Arabis hirsuta*. We also motored from Odda to the great waterfall, the Laatefos, situate in most beautiful surroundings. Just opposite, on the other side of the valley, is the still more graceful Espelandsfos, and close to the Laatefos is the Skarsfos, the waters of which unite near the bridge with the Laatefos, and we saw rainbows innumerable from the spray which drenched the road and incidentally ourselves. We then drove on to the Gorfsvingane, a most wonderful ravine. We reached the top of the water-shed, about 3300 feet, above Odda—a pretty good climb for the morning's work. Thereabouts we had some excellent botanising for we found *Saxifraga rivularis*, *S. caespitosa*, *Cardamine bellidifolia*, *Veronica alpina*, *Bartsia alpina*, *Agrostis borealis*, *Carex saxatilis*, *Stellaria borealis*, *Hieracium convolutum*, and a host of other rarities.

From Odda we went to Eide on the Hardanger Fiord, and thence by motor (30 kilos) to Voss, passing through Spruce woods and the profound valley of the Skjervet with its imposing waterfall, the white spray in splendid contrast with the black slate rock over which it pours. The hotel at Voss is palatial. The Kaiser, in his palmy days, presented it with three of his signed pictures. But more pleasing to us was the walk by the Vangsvand lake where we found *Woodsia alpina* and *ilvensis*, *Limosella*, *Subularia* and *Barbarea stricta*. From Voss we took the evening train for Bergen and left the next day for Newcastle by the Venus, but a soiled and unpleasing goddess she was, and the landing arrangements and the stupid Custom-house troubles were a great contrast to the methods of our foreign friends. Really ours are a disgrace to a civilised country. Nor did the 7s 6d cab fare from the landing stage to the railway station add any degree of pleasure to the proceedings.

The result of our visit was that I noted 650 species growing in Norway, of which 45 were new to me. It must be remembered that plants were sought in the places we visited—we made no special quest for any. There is no space here to praise the beauty spots, but one may say that the scenery is of the highest order. One takes this opportunity of acknowledging the uniform courtesy and kindness we received from the people, and from Professor Holmboe, who gave most valued assistance on plant determination.

VARIATIONS IN THE VEGETATION ALONG THE OUTCROP OF THE LAWERS-CAENLOCHAN SCHIST.

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The botanist, travelling in the Highlands of Scotland, is struck by the sharp contrast in the colours of the mountains. Some are green from base to summit, others are purple to varying altitudes. This contrast is most apparent in the vicinity of the outcrop of the Lawers-Caenlochan schist which, though not always exposed, extends from the Isle of Jura on the west to Clova in north-west Forfarshire in the east. Where this formation outcrops in the Highlands, as it does in Beinn Laoigh, Beinn Heasgarnich, Cam Creag, Meall nan Tarmachan, Creag an Lochan, Ben Lawers, Ben Vrackie, Caenlochan, Canness, and Clova—to mention a few, the mountains are green. On the other hand, the Paps of Jura and Schiehallion are of the purple type. That this local difference is not due to climatic factors is evident from the fact that both types appear in close proximity. An investigation of the edaphic factors at work helps to solve the problem. The Lawers-Caenlochan Schist, or sericite schist as it is sometimes called, is rich in mineral salts, chiefly lime, and has associated with it other horizons alike rich—the Black Schist and the Hornblende Schist. These rocks weather readily into a rich soil not merely on account of their chemical composition but also because of their physical properties, for they disintegrate to form a porous soil with suitable water-holding capacity and adequate aeration. The rocks of the purple hills are chiefly quartzites and quartz-mica schists, and are therefore poor in salts. Their friable nature and the instability of their screes also tend to produce a poor soil. To instance one example in the western Breadalbanes, Beinn Laoigh and Meall Odhar confront each other across the valley of the Conenish near Tyndrum. The former is mainly an outcrop of the Lawers-Caenlochan Schist, the latter chiefly quartzite and quartz-mica schist. The former presents an area of alpine-grassland merging downwards into grass moorland, the latter is carpeted on its summit with *Loiseleuria procumbens*, a plant not found on Beinn Laoigh; its flanks are heather-clad and its moors are of the acid type.

The general appearance of the vegetation of the Lawers-Caenlochan schist has thus been indicated as a distinctly noticeable feature in the Highlands of Scotland. Its vegetation is rich and lush, and its soil is peculiarly suitable for the development of an Arctic-Alpine Flora. P. Macnair, in *Trans. Perth. Soc. Nat. Science*, vol. ii., 1898, concludes thus:—" Our contention that in this band of sericite schist . . . we have one of the most important factors in determining the distribution of our alpine plants and that wherever this band of schist rises to a sufficient altitude, there these plants have been enabled to maintain existence in the great struggle which has exterminated them from the plains." The above publication is supplemented by a sketch map showing the areas of the outcrops. A large number of arctic-alpine plants are common to all the mountains of the Highlands of Scotland; but in addition to these are several of the rarer boreal plants which are to be found along the outcrop of the Lawers-Caenlochan schist. Further, the study of three distinct areas along the outcrop has revealed some interesting variations in its vegetation. (F. Buchanan White, J. H. Balfour and others have already commented upon the variations between the flora of Ben Lawers and that of Clova.) The areas selected for comparison here are:—

1. Beinn Laoigh (3708 ft.), at the western extremity of the Breadalbanes, on the borders of Perthshire and Argyllshire, the actual summit being in the former county.
2. Ben Lawers (3984 ft.), in Perthshire, overlooking Loch Tay —the Mecca of Scottish Arctic-Alpine Botanists.
3. Clova, in N.-W. Forfarshire—the home and haunt of Don and his " reputed discoveries."

For information regarding the above see the publications in the *Journal of Botany*, *The Annals of Scottish Natural History*, by Dr Druce, P. Ewing, etc. See also the *Transactions of Perth. Soc. Nat. Science*, and of other local societies (articles by F. B. White, R. Smith, P. Macnair, etc.). See, too, " Scottish Mountain Botany," by Professor Bower, in *The Scottish Mountaineering Club Guide* Vol. 1.

In *Trans. Linn. Soc.* vol. xxiii., Sir Joseph Hooker, "On the Distribution of Arctic Plants," gives the following list of sixty-one species which he mentions as "the most Arctic plants of general distribution that are found far north in all the Arctic areas." Their distribution as to the three areas under consideration is indicated here. × This signifies that it is in the British flora.

	*Laoigh.	Lawers.	Clova.
Ranunculus nivalis - -	—	—	—
× *R. auricomus* - - -	—	—	—
R. pygmaeus - - -	—	—	—
Braya alpina - - -	—	—	—
Cardamine bellidifolia	—	—	—
× *C. pratensis* - - -	×	×	×
Draba alpina - - -	—	—	—
D. androsacea - - -	—	—	—
D. nirta - - - - -	—	—	—
D. muricella - - -	—	—	—
× *D. incana* - - - -	×	×	×
× *D. rupestris* - -	×	×	—
× *Cochlearia officinalis* -	×	×	×
× *C. anglica* - - - -	—	—	—
× *Silene acaulis* - - -	×	×	×
Lychnis apetala - -	—	—	—
× *Arenaria verna* - -	—	×	—
A. arctica - - - -	—	—	—
Stellaria longipes - -	—	—	—
× *Cerastium alpinum* -	×	×	×
Potentilla nivea - -	—	—	—
P. frigida - - - -	—	—	—
× *Dryas octopetala* - -	×	—	×
Epilobium latifolium -	—	—	—
× *Sedum Rhodiola* - -	×	×	×
× *Chrysosplenium alternifolium* - - - -	×	×	×
× *Saxifraga oppositifolia* - - - -	×	×	×
× *S. caespitosa* - - -	—	—	—

	Laoigh.	Lawers.	Clova.
× *S. cernua*	—	×	—
× *S. rivularis*	—	×	×
× *S. nivalis*	×	×	×
× *S. stellaris*	×	×	×
S. flagellaris	—	—	—
× *S. Hirculus*	—	—	—
Antennaria alpina	—	—	—
× *Erigeron alpinum*	—	×	×
× *Taraxacum Dens-leonis*	×	×	×
Cassiopeia tetragona	—	—	—
Pedicularis hirsuta	—	—	—
P. sudetica	—	—	—
× *Oxyria reniformis*	×	×	×
× *Polygonum viviparum*	×	×	×
× *Empetrum nigrum*	×	×	×
× *Salix herbacea*	×	×	×
× *S. reticulata*	×	×	×
× *Luzula arcuata*	—	—	×
× *Juncus biglumis*	×	×	×
Carex fuliginosa	—	—	—
× *C. aquatilis*	—	—	×
Eriophorum capitatum	—	—	—
× *E. polystachion*	×	×	×
× *Alopecurus alpinus*	—	—	×
Deyeuxia Lapponica	—	—	—
× *Deschampsia caespitosa*	×	×	×
Phippsia algida	—	—	—
Colpodium latifolium	—	—	—
× *Poa flexuosa* (=*P. laxa*)	×	×	×
× *P. pratensis*	×	×	×
× *P. nemoralis*	×	×	×
× *Festuca ovina*	×	×	×
—	—	—	—
36	25	28	29

Hooker also gives a further list of twenty-two species which "are also inhabitants of all the five Arctic areas, but do not normally attain such high latitudes as the foregoing." (*Draba rupestris* is here omitted: it occurs in both lists.)

	Laoigh.	Lawers.	Clova.
Ranunculus lapponicus	—	—	—
× *Viola palustris* - -	×	×	×
× *Honkenya peploides* -	—	—	—
× *Epilobium angustifolium*	—	—	×
× *E. alpinum* - - - -	×	×	×
× *Hippurus vulgaris* -	—	—	—
Artemisia borealis - -	—	—	—
× *Vaccinium uliginosum*	×	×	×
× *V. Vitis-Idaea* - - -	×	×	×
× *Ledum palustre* - -	—	—	—
× *Pyrola rotundifolia* -	×	×	×
× *Polemonium coeruleum*	—	—	—
Pedicularis lapponica	—	—	—
× *Armeria vulgaris* - - (*Statice planifolia*)	×	×	×
× *Betula nana* - - -	—	—	×
× *Salix lanata* - - - -	—	—	—
× *S. glauca* (*S. lapponum*)	—	×	×
S. alpestris - - - -	—	—	—
× *Luzula campestris* -	×	×	×
× *Carex vesicaria* - -	×	×	×
× *Eriophorum vaginatum*	×	×	×
Atropis maritima - -	—	—	—
—	—	—	—
17	9	10	12

SUMMARY.

		Britain	Laoigh	Lawers	Clova
Hooker's 1st List	61	36	25	28	29
Hooker's 2nd List	22	17	9	10	12
	—	—	—	—	—
Total - -	83	53	34	38	41

It is evident from the above that the flora varies from west to east along the outcrop. Not only does the number of arctic-alpines increase towards the east, which would imply that the conditions are more boreal in that direction, but there is an interesting variation in the floras of these three areas.

Hooker's two lists do not include all the arctic-alpine species of our Scottish Highlands. Some, although they do not extend so far north, fall to be considered and a few of them will be dealt with in a similar manner.

	Laoigh.	Lawers.	Clova.
Thalictrum alpinum -	×	×	×
Aquilegia alpina - -	—	—	×
Trollius europaeus -	×	×	×
Arabis petraea - - -	×	×	×
v. *grandifolia* Druce	×	—	—
Draba incana, v. *confusa*	×	×	×
Thlaspi alpestre - -	—	—	×
Lychnis alpina - -	—	—	×
Arenaria sedoides - -	×	×	×
A. rubella - - - -	—	×	—
Sagina saginoides - -	×	×	×
Astragalus alpinus -	—	—	×
Oxytropis campestris -	—	—	×
Potentilla Crantzii -	×	×	×
P. Sibbaldi - - - -	×	×	×
Alchemilla alpina - -	×	×	×
Cornus suecica - - -	×	×	×
Linnaea borealis - -	—	Finlarig Wood.	×
Galium boreale - - -	×	×	×
Gnaphalium supinum	×	×	×
Saussurea alpina - -	×	×	×
Lactuca alpina - -	—	—	×
Pyrola secunda - -	×	×	×
Gentiana nivalis - -	—	×	×
Myosotis pyrenaica -	—	×	×
Veronica alpina - -	—	×	×
V. fruticans - - -	—	×	×
Bartsia alpina - -	×	—	—
Tofieldia palustris -	×	×	×
Juncus triglumis - -	×	×	×

	Laoigh.	Lawers.	Clova.
J. trifidus - - - -	×	×	×
J. castaneus - - -	×	×	×
Luzula spicata - - -	×	×	×
Carex saxatilis - -	×	×	×
Kobresia bipartita -	×	—	—
Phleum alpinum - -	—	×	×
Woodsia alpina - -	×	×	×
Cystopteris montana -	×	×	×
Lycopodium annotinum	—	—	×
Selaginella selaginoides	×	×	×
	26	30	36

The above table proclaims the same facts as the previous tables, *viz.*, that the conditions in the east are more favourable to the growth of an arctic-alpine vegetation than they are on the west, and that there are interesting differences in the floras of the three areas. These two conditions will be discussed separately, for the former depends chiefly on the climatic and topographic factors whilst the latter depends mainly upon the edaphic factors.

But, before proceeding further with these discussions two or three items must be mentioned, though they have to be considered in their proper perspective.

Firstly, and to quote H. C. Watson, " Sheep and the dealers in specimens are fast destroying the scarcer alpine species."

Secondly, enthusiastic field-botanists and others have transferred species from area to area—and sometimes from remote areas. Professor J. H. Balfour planted seeds of *Phyllodoce coerulea* on the Sow of Athole, and he adds, in his description, that there may have been some seeds of *P. empetrifolium* amongst them. The native plant was at that time showing signs of being greatly reduced in numbers. Again J. Sadler planted *Eriophorum alpinum* in Glen Dole—but it no longer grows there. These are but two examples.

Perhaps, as a *Thirdly*, it might be added that in the rear of the retreating ice, it is quite possible that certain boreal species, *e.g.*, *Saxifraga cernua*, did not find a roothold on each of the three areas under consideration. Further, it should be noted that the Clova area is more extensive than either Laoigh or Lawers. These are a few of the difficulties which confront the student of ecology in the Highlands of Scotland.

When the three lists of plants given above are considered, it is seen that several species are found on Lawers which do not grow on Laoigh, *e.g.*,

Arenaria rubella,
A. verna,
Saxifraga cernua,
S. rivularis,
Erigeron alpinum,
Gentiana nivalis,
Myosotis pyrenaica,
Veronica alpina,
V. fruticans,
Salix lapponum,
Phleum alpinum.

On the other hand, Lawers is without the following plants found on Laoigh:—

Arabis petraea, var. *grandifolia* Druce.
Dryas octopetala,
Bartsia alpina,
Kobresia bipartita.

There is an old record for *Dryas* on Lawers but its absence here may be due to the beauty of the species and the rapacity of dealers on Lawers, for the plant grows in Clova and is fairly widely distributed along the outcrop of the sericite, e.g., Cam Creag, Heasgarnich. Ben Vrackie, &c. When the geological formation of the two mountains is considered it is found that the Lawers-Caenlochan Schist forms the base of Laoigh, whereas it outcrops in the highest altitudes of Lawers. Thus, although both mountains are clad from base to summit with the usual arctic-alpine species the lower escarpments of Laoigh bear the rare plants of the sericite and the upper heights of Lawers are also rich in them; but because of the difference in altitude of the outcrops Lawers, as the lists show, possesses the more boreal plants.

Now, if the whole extent of the outcrop of the Lawers-Caenlochan Schist be reviewed from west to east, it is found that, apart from the topographical factor, the vegetation tends to become more boreal as the area is traversed. The following considerations will shew that this is mainly due to the climatic conditions. On the west the precipitation is much greater than it is on the east. The average annual rainfall for Beinn Laoigh exceeds 100 inches; on the east it is not half that amount. But the variations in temperature are more important. The original peneplane of the Scottish Highlands has not been dissected to the same extent on the east as it has been on the west. The Breadalbanes are more of the nature of isolated peaks. The panorama, viewed from the summit of Lawers, bears this out as do the names of the peaks in this region, —the term "Stob" being of very frequent occurence. Beinn Laoigh, for example, is a jagged, sphinx-like monument reared over the remains of at least half-a-dozen glaciers which departed existence in the corries which are now the glory of the Ben. Conditions are quite otherwise in the east. There the processes of subaerial denudation have not been so active, due, among other things no doubt, to the measure of precipitation and to the relations between the centres of distribution of the superincumbent ice. Thus it is that in the east the elevated tableland still exists with summits, mounds rather than peaks uprising from it. The larger corries seldom appear above the valley floors (*e.g.*, Caenlochan, Canness, Glen Fee, etc.). The glaciers were cut off in their infancy by the ameliorating climate which obtained during the waning of the ice-age. This extensive eastern mass of land reared above 2700 ft. would therefore be much colder than the isolated peaks of the west, fanned as they are by the prevailing south-west winds from the Atlantic which as they trend eastwards are more and more chilled and add to the lowering of the temperature in the region of Clova.

Thus, in addition to the more alpine plants found on Ben Lawers (as compared with Beinn Laoigh), Clova contributes :—

Lactuca alpina,
Luzula arcuata (needs confirmation).
Alopecurus alpinus,
Lycopodium annotinum.

Further, it is also a significant fact that *Arabis petraea*, var. *grandifolia* of Laoigh is not found to the east, but, where the calcareous schists outcrop in Ben More in Mull, this variety grows abundantly. *Bartsia alpina* and *Kobresia bipartita*, sparingly distributed throughout the western Breadalbanes, thin out towards the east. *Draba incana*, var. *confusa*, on the other hand, is rare on Laoigh but is the common form in Caenlochan. And again, as the Lawers-Caenlochan Schist is traced from west to east it is found that the arctic-alpines grow at lower altitudes, and that the higher altitudes of the east possess a more boreal vegetation.

But it is not due to climatic factors alone that variations exist along this outcrop. The edaphic factors also add their quota. In the Clova area, although it is more extensive than either of the other two under review, the geological formation reveals that the sericite has, associated with it, rocks which are not present in the Laoigh or Lawers areas. Intrusive granite is present, and is a favourite nidus for *Astragalus alpinus* and *Luzula arcuata*. The writer has not been fortunate enough to see *Oxytropis campestris* growing in its Clova fastness; but Professor J. H. Balfour records that the rocks on which it grows "appear in some respects to differ from those in the immediate neighbourhood." Again, *Lychnis alpina* glories on the wind-swept summit of Little Kilrannoch. What a lovely picture it presented in 1921, in fine condition, and in comparative abundance. (But arctic-alpine flowers all showed a wealth of bloom during the summer of that year. Even *Saxifraga cernua*, on Lawers, blossomed in profusion!) *Lychnis alpina* luxuriates on a soil formed from a decomposing serpentine rock. where it was found in association with *Statice planifolia*, *Cochlearia micacea*, *Deschampsia flexuosa* and *Festuca ovina*.

A few species of the Clova area still remain to be dealt with. It may have been expected that *Thlaspi alpestre* would have been treated in the preceding paragraph, seeing that it is a typical limestone plant; but the writer has been unable to find any record of it by Don as a plant of the Clova area. Had it existed there in his time it could hardly, from its present distribution, have missed his keen eye. It must, therefore, be considered as an introduced plant. *Aquilegia alpina*, observed by the writer on a few ledges at the head of Caenlochan, in 1921, cannot be regarded as otherwise. With

Epilobium angustifolium it seems to be different. It is found as a mountain species in the northern and eastern Highlands (not so *Thlaspi*), and unless there is any definite record of its introduction to Clova it falls to be reckoned as native. *Linnaea borealis* is not found on Laoigh, for Beinn Laoigh has no woodlands; and although not found on Ben Lawers, it is not far distant, being recorded from Finlarig Wood at Killin. In Clova, however, it is more plentiful.

When the different ecological factors are taken into account the transition from west to east is fairly gradual. This is specially evident between Laoigh and Lawers, and in the bens which extend to the north, where the sericite outcrops. It is a further cry from Lawers to Clova; but, in between, stands Ben Vrackie pointing either way. Scotland has no grander floral exhibit than this rich display of arctic-alpines which adorns the outcrop of the Lawers-Caenlochan Schist.

AN IMPORTANT QUESTION.

ERNEST ALMQUIST.

I intend to summon all friends of the flora to observe the wild allogams in Nature.

In Mendelian works we meet the opinion that a great many of the species must be hybridous, especially all allogams. We read, for instance, as follows: Whenever the impregnation is generally fulfilled by insects or the wind, it cannot exist in pure lines in Nature, because seldom or never identical and homozygous individuals copulate. Thus no constant species but only ephemeric forms are created. The Linnean species are " average types." Such assertions we often meet with in modern literature. It must be observed that they do not originate from direct observations on or experience of Nature. The Mendelists generally study by experiments and have not much time for Nature. It is true that groups and genera exist without constant species, for instance, Salices. But one claims the same for all allogams. I think every botanist and amateur of plants must have some interest in how Nature really stands. It cannot be very difficult to investigate, whether, for instance, *Digitalis purpurea* in the woods of England produces bastards or not. It is probable that many wild allogams are suitable for observation, as *Verbascum Thapsus*, *Aquilegia vulgaris*, several species of *Papaver*, *Geum*, thistles, &c., &c. The observations must embrace great numbers. Bastards produced by impregnation from relatives growing hard by must be excluded. Of course it is our aim to look for species that produce bastards by their own nature.

Sowing is another way for clearing up the question. I have received plenty of plants from seed of wild *Digitalis*, all evidently the same year by year, with occasionally some sterile individuals. I have cultivated several of the other named species without being able to discover bastards. Perhaps, however, the numbers were too small or perhaps the germs of more delicate forms were not protected enough. My experience is not sufficient.

A third way is especially interesting. Probably we are able to follow Nature's work for transforming bastards into constant, homozygous forms and to fix the time for the transformation. I cultivate *Oenothera Lamarckiana* on a suitable ground. The forms grow abundantly without protection year after year. I suppose that the strain will gradually approach to constancy and that it will produce different species in different environments. I have commenced cultures of several other strains for the same purpose. If some experiments succeed we will at once possess evidence that Nature is able to transform bastards into homogenous, constant species.

Here I have given only my opinion on the practical methods for clearing up the question, but not the theoretical motives which I have treated of in another place.

THE HISTORY OF THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

By G. Claridge Druce.

Having now filled the office of Secretary for twenty years, perhaps I may be allowed to briefly refer to the progress of the Botanical Society and Exchange Club.

The Botanical Society of London was founded on July 27 1836, under the Presidency of Dr J. E. Gray, F.R.S., son of S. E. Gray, the author of "A Natural Arrangement of British Plants," published in 1821. The anniversary meeting was to be held on the birthday of John Ray, and its badge or crest was the *Victoria Regia*, a description and figure of which appeared in its first publication from the pen of its discoverer, Sir R. H. Schomburgk.

The Exchange Club Section was carried on by Mr H. C. Watson and Dr J. Boswell Syme, the author of the third edition of "English Botany." The expenses attendant on having rooms in London and a paid official were so great as to cause its dissolution about 1856. Its library and large herbaria were sold. Some of its members were, however, loathe to see the termination of its work, and the Exchange Club was carried on under the name of the Thirsk Natural History Botanical Exchange Club, Mr J. Gilbert Baker acting as distributor until 1866. In 1869 Mr Baker, whose residence at Thirsk had been destroyed by fire, removed to Kew, where he was put on the permanent staff of the Herbarium. The Distribution went on in London and the name was changed to the London Botanical Exchange Club. (The London Catalogue was prepared by Mr H. C. Watson mainly for its use.) This Distribution went on until 1869, when the name was again changed to 'The Botanical Exchange Club.' In 1879 Mr Charles Bailey became Secretary and the name was altered to 'The Botanical Exchange Club of the British Isles.' A fresh distributor was selected each year, the last, under Mr Bailey's management, being Mr J. Walter White in 1901. During all these years Mr Bailey acted in a most efficient and generous manner. The finance of the club was all wrong because the absurdly small subscription of 5s, even if paid, was of course insufficient to produce yearly reports and an occasional desiderata list. Mr Bailey, however, cheerfully bore the loss which during his tenure of office amounted to between two and three hundred pounds. Owing to some reason, which I was never able to understand, some of the members started, or supported the formation of, another club on similar lines. This did not increase the number of members belonging to the senior club. There were urgent calls on Mr Bailey in other directions and he intimated his intention of resigning. Three courses were open (1) to allow the club to come to an end; (2) to merge with the other club; (3) to carry on with some fresh methods. Many members were unwilling that it should cease or merge with the other club, and I wasted much time and money to see if a bridge could not be found. One member of the junior club was obdurate, however, and so the scheme for union fell through. After Mr Bailey had circularised the members as to his resignation I was asked by a practically unanimous vote to manage its affairs. This wording was, advisedly, adopted as it conveyed something more than merely secretarial duties. As one of the members who pressed for this said, "We want you to direct and inspire the distributing duties and to work the scientific side of the club's sphere." Therefore in 1902 I acted as Distributor and took over the responsibility of the club's management. Mr Bailey handed me the sum of £7 10s to produce the next *Report*. We then had about 36 members on our books but the subscriptions, if paid at all, were paid most unpunctually, one or two members who also belonged to the other club being eight years in arrears. The pages of the Reports for the 24 years from 1879 to 1902 had a pagination of 718, averaging 36 a year, and the number of plants sent in for exchange amounted to about 88,000, an average of 3666 yearly. The names of the various distributors who have acted in the past 20 years are appended, from which it will be seen how representative they are of the best British botanists. In the last 20 years about 108,000 plants have been exchanged, an average of 5400, which, as will be seen, is a gratifying increase of about 50 per cent. The pagination of the Reports has increased to nearly 3400 pages, an average of 170. The increase has occurred chiefly in the last 12 years. The two last volumes have averaged nearly 300 pages annually, so that the increased subscription bears fruit.

Report.	Published.	Distributor.	No. of Specimens. sent for Exchange.
	VOLUME II. pp. 508.		
1903-1904.	March	G. Claridge Druce	2209
1904-1905.	August	J. Groves, F.L.S.	3897
1905-1906.	April	J. Walter White, F.L.S.	4543
1906-1907.	April	Rev. W. R. Linton, M.A.	4556
1907-1908.	May	Rev. H. J. Riddelsdell, M.A.	4994
1908-1909.	September	William Bell	4195
1909 1910.	May	S. H. Bickham, F.L.S.	3906
1910-1911.		C. E. Moss, D.Sc.	4011
	VOLUME III. pp. 516.		
1911-1912.	Part i, April	Secretary	
	Part ii, June	J. A. Wheldon, F.L.S.	5346
1912-1913.	Part i, June	Secretary.	
	Part ii, August	John Cryer	8656
1913-1914.	Part i, February	Secretary.	
	Part ii, October	A Bruce Jackson, A.L.S.	8582
	VOLUME IV. pp. 653.		
1914-1915.	Part i, May	Secretary.	
	Part ii, November	R. H. Corstorphine, B.Sc.	6537
1915-1916.	Part i, April	Secretary.	
	Part ii, November	A. R. Horwood, F.L.S.	8153
1916-1917.	Part i, May	Secretary.	
	Part ii, June	W. H. Pearsall & D. Lumb	5453
	VOLUME V. pp. 849.		
1917-1918.	Part i. September	Secretary.	
	Part ii, October	C. E. Britton	6223
1918-1919.	Part i, July	Secretary.	
	Part ii, October	W. C. Barton, M.A.	5340

Report.	Published.	Distributor.	No. of Specimens sent for Exchange.
1919-1920.	Part i, October	Secretary.	
	Part ii, October	J. Walter White, F.L.S., & Miss I. M. Roper, F.L.S.	6257
	VOLUME VI. pp. 866.		
1920-1921.	Part i, September	Secretary.	
	Part ii, September	G. C. Brown...	4837
1921-1922.	Part i, September	Secretary.	
	Part ii, September	Miss E. N. Thomas, D.Sc., Miss Vachell, F.L.S., and Mr A. E. Wade ...	4836
1922-1923.	Part i	Secretary.	
	Part ii,	L. V. Lester-Garland, F.L.S.	4903

The membership roll has increased from 28 to about 500. One need scarcely say that the amount of work which falls upon the Secretary has much increased, not only so far as clerical duties are concerned, but in the preparation of the Annual Report. This is no light task. In addition there is the identification of the plants which are sent. Last year many thousands passed through his hands. Members could reduce the merely routine work very much by being careful to send in a tin box fresh specimens each with an attached label (tied on with a cotton thread) bearing the suggested name, the habitat and any note of interest. When dried specimens are sent they should be fastened with a strip or two of gummed paper to a sheet of newspaper and the accompanying label with particulars may be pinned to that. Loose labels and plants are an abomination. Gummed labels become unfastened from fresh specimens and postage stamps—such is the perversity of things—always get stuck together. Therefore the accompanying note and addressed label with stamps should be tied outside the tin and the tin itself wrapped in paper. The return postage (in the interest of the Society) must always be sent.

I have to very warmly thank the Distributors, the Critics, both British and Foreign—of the latter notably Dr Albert Thellung—the various writers of articles and communicators of specimens, those who have assisted in proof-reading—notably Dr Vines and Mr and Mrs Corstorphine, and the Publishers for their generous aid: also those who have kindly helped in Benevolent matters. Especially am I grateful for the very loyal support and continued kindness of the members. One cannot hope indefinitely to bear the burden which such an organisation entails. I have, however, the greatest pleasure in doing what little I am able to, in assisting my fellow workers, and to promote the study of field Botany. It will be a pleasure to continue the duties so long as I have the approval and support of the members. Any suggestions for improving our methods are always welcomed.

In answer to the request of several members I have ventured to insert a portrait of myself to mark the prolonged tenure of the office.

VARIOUS NOTES.

Orchid Seeds Germinated on Sugar Medium. Nearly 100 per cent. of the seeds germinated when sown on a sugar-agar in tubes. Prof. Kingdon, of Cornell University, was led to think that the seeds are not so dependent on certain fungi as upon the nourishment which these fungi afford.

Cryptomeria japonica. The wonderful avenue of these trees, which lead to Nikko in Japan, was planted between 1631 and 1651. It stretches for 24 miles and there remain 18,308 trees. At the building of the temples—the burial place of the Jeyasu—his successor ordered the Daimios of the Empire to send each a stone or bronze lantern to decorate the ground about the mortuary temple. All complied with the order but one man, Malsudaira Masalsuma, who, too poor to send a lantern, offered to plant trees by the wayside that visitors to the temple might be shaded from the heat of the sun. This magnificent avenue is now one of the wonder-sights of Japan. See Bulletin of Popular Information, Arnold Arboretum.

We are delighted to see the honour conferred on our member, Mr J. Fraser, of Kew—that of V.M.H., the Victoria Medal of Honour in Horticulture. This he has undoubtedly earned. Mr Fraser is not only a distinguished horticulturist but he is an able and critical botanist, who has an excellent knowledge of Britain and British plants. Mr Fraser assisted the late Lord Avebury in the production of the "Contribution to our Knowledge of Seedlings and Buds and Stipules," and he remained with him as botanical assistant up to 1912.

Dr Otto Stapf, who for thirty years has been associated with Kew, and for fourteen years was Keeper of the Herbarium, in which office he did signal work, has retired. He is succeeded by Mr Arthur Disbrowe Cotton, who has held an important post under the Board of Agriculture in the Department of Plant Pathology at Rothamsted.

Major Chipp, B.Sc., M.C., has been appointed Assistant Director at Kew.

Dr Otto Buchtien, formerly Director of the Museo Nacionel, La Paz, Bolivia, has died. His herbarium consisting, says the *Gardeners' Chronicle*, of about 4500 specimens, has been acquired by the United States National Museum.

George Forrest's collection of Chinese plants, 8000 in number, has been presented to Kew.

Prof. J. H. Trail, F.R.S. A memorial, consisting of a plaque portrait, is to be placed in the Botany Department of Aberdeen University, with which he was associated for nearly forty years. It is hoped also to issue a memorial volume in which will be published the Flora of the City Parish of Aberdeen. This had been prepared by Prof. Trail. The volume will contain much interesting autobiographical material and a complete bibliography of his publications.

The *Journal of Indian Botany* has now been taken over by the Indian Botanical Society. Prof. P. F. Fyson is to be the Editor He started the Journal as a private venture.

We are glad to notice that once again the *Botanical Magazine* has been resumed. Under the able editorship of Dr Otto Stapf we trust it will have the circulation it deserves. This year also witnesses the publication of a new edition of Babington's Manual by Mr A. J. Wilmott, and a Guide to the Botanical Gardens at Cambridge by the Director.

FLOWERING PLANTS OF SOUTH AFRICA. Vol. 2, 1922. A new genus, ROADIA, closely allied to the *Mesembryanthemum*, is established by Mr N. E. Brown. There are many other new plants described.

NEW SPECIES FROM MOUNT EVEREST. *Aconitum orochryseum* Stapf at 15,000 feet, Wollaston. *Androsace sessiliflora* Turrill, at 17,000 feet, on Chamolhari, about 130 miles from Everest. *Dracocephalum breviflorum* Turrill, at 13,000 feet, Wollaston.

BOX HILL, SURREY. This beautiful and interesting area which now belongs to the National Trust has, through the generosity of Miss Warburg, been supplemented by 70 additional acres, which she purchased from the trustees of Lord Frederick Hope. In the area are Beech and Larch Woods and a Round Tower. Heaven forfend it from the enthusiast who might like to plant it with alpines and rhododendrons.

WILLIAM A. L. WATSON, V.M.H., has retired from the Curatorship of the Royal Gardens, Kew, and has been succeeded by an extremely efficient horticulturist, Mr W. J. Bean, V.M.H., the author of an excellent work, "Trees and Shrubs Hardy in the British Isles." Mr Watson succeeded my old friend, Mr George Nicholson, the author of the "Illustrated Dictionary of Gardening." In Mr Watson he had a very worthy successor. Sir Joseph Hooker dedicated the 130th volume of the Botanical Magazine to Watson as "my sense of the value of the service which you have rendered to this work."

During the year 1921 Kew Gardens were visited by 3.236.308 people, a very substantial increase over the preceding year. They have now been open for 81 years, the opening day being April 1, 1841. 20,000 entered the gates on the August Bank Holiday.

We congratulate our member, Mr Spencer Bickham, on the beautiful *Dianthus* which is connected with his name. It makes a most attractive rock-garden plant.

The British Bryological Society. We are greatly pleased to see that this Society has been formed. The well known cryptogamic botanist, Mr D. Jones, M.Sc., Rock Cottage, Harlech, is the Hon. General Secretary: Mr H. N. Dixon, President; Mr W. H. Pearson, vice-President, and the distributors, Mr F. Rilstone, for the Mosses, and Mr A. Wilson for the Hepatics. The Treasurers are Mr J. A. Wheldon and the Rev. R. Jackett, and the Secretary, Miss Eleonora Armitage. The two sections of the Moss Exchange Club are now merged in this Society and an Annual Meeting is to be held. The Subscription is only 5s. Under such a splendid set of officers the Society should be a great success. Members wishing to join should apply to the General Secretary.

Links with the Past.—My great-grandfather, Philip Miller, compiler of the "Gardeners' Dictionary," was born 1691, and died in 1771. My grandfather, Charles Miller, was curator of the Cambridge University Botanical Gardens, and then Governor of Bencoolen and Fort Marlborough, Sumatra, and was born in 1739, died 1817. My mother, Mary Amelia Miller, was born in 1800, married Edward Layton in 1821, and died 1873. I am their younger son, and am now 79. So that since my great-grandfather's birth and the present year there is a period of 231 years, which, with four lives, makes an average of 57.3 years to a generation.—Rev. W. E. Layton, in *The Times*.

Floral Clocks must always be rather curiosities and playthings than things of practical usefulness, for all flowers vary more or less in their times of opening and closing. It is, indeed, possible anywhere in the country to arrive approximately at the time of day by the observation of flowers, as many of our old plant names testify, and the idea of floral clocks is an old one. Everybody knows Marvell's verses:—

> "How well the skilful gard'ner drew
> Of flowers and herbs this dial new! . . . .
> How could such sweet and wholesome hours
> Be reckon'd, but with herbs and flowers!"

Charlotte Smith's "Flora's Horologe" is less familiar, but is interesting because it gives the names of most of the flowers that form the clock. The *Nymphæa* (white water lily) tells both the hour of dawn and that of the sunset; the daisy, the Star of Bethlehem, "the humble *Arenaria*—a "bastard name," says Gerard, for bucks' horn—"the Hieraciums' various tribe," Succory, *Silene* (*noctiflora*), and, of course, the Goats'-beard, or Go-to-bed-at-noon, all play their parts. A more charming clock than hers, however, is that of Siebenkäs, in Jean Paul's romance, "Flower, Fruit and Thorn Pieces," all particulars of which I forget. Richter seems to have the same idea in mind when describing the Lilac garden in his later romance, "Titan." Friend has a long list of flowers that might be used as items in such a time-piece—the Marvel of Peru, or Four o'clock (*Mirabilis*), *Ornithogalum*, or Seven o'clock Lady, the Venice Mallow, or Good-night-at-noon, of which, however, Gerard says that it should be called "Good-night-at-nine," and others. The following selection of plants is claimed ("Scientific American") to be the most perfect list for the floral clock up to date. Slight variations in the times of opening might occur in different localities, but it is remarkable how closely the various plants adhere to the times of opening. The times of the expanding of the buds are in all cases put before the name of the plant: 6 a.m., yellow hawkweed (*Hieracium aurantiacum*); 7 a.m., marigold (*Calendula pluvialis*); 8 a.m., Venus looking-glass (*Specularia Speculum*); 9 a.m., corn marigold (*Calendula arvensis*); 10 a.m., clovewort; 11 a.m., mountain dandelion (*Taraxacum montanum*); 12 noon, fig marigold (*Mesembryanthemum*); 1 p.m., single pinks (*Dianthus*); 2 p.m., *Pyrethrum corymbosum*; 3 p.m., red hawkweed; 4 p.m., lady of the night (*Mirabilis dichotoma*); 5 p.m., catchfly (*Silene noctiflora*).—*Chemist & Druggist*, 1922.

CLEARING SWIMMING POND OF GROWTH: (Bowers—118/5).—Where there is much fully-developed growth on the surface of the water, it is advisable to draw as much as possible of it out of the water by means of a rake before applying the radical remedy. Copper sulphate is now commonly used, and it has been found that a proportion of one part of the salt to three million parts of water is harmless to fish and does not render the water dangerous to human life. The usual method of applying the copper sulphate is to drag the crystals in a canvas bag through the water at the stern of a boat, but an improvement on that method is to scatter the crushed or roughly-powdered sulphate over the surface of the water, just as one sows seed. Used in this proportion, it is stated that no trace of copper remains in the water at the end of a week. The application of brine would not, we think, have any perceptible effect.—*Pharm. Journ.*

Among the Sales of Books in 1922 may be mentioned that of the Cassiobury Library, where Redouté's Les Liliacées fetched £100.

" If a man can make a better book, preach a better sermon, or make a better mouse-trap than his neighbour, though he build his house in the woods, the world will make a beaten track to his door." —EMERSON.

PERSONAL NOTES.

Mrs ISABEL ADAMS, F.L.S., is painting British Aquatics. Members wishing to help in collecting specimens are asked to communicate with her at 14 Vernon Road, Edgbaston.

Mrs PERRIN, 23 Holland Villas Road, London, W. 14, is continuing her beautiful paintings of British Plants. Members willing to assist in collecting specimens are asked to write to the above address.

Mr T. A. DYMES, F.L.S., Carthona, West Drayton, Middlesex, wants ripe capsules of British Orchids, especially *Malaxis*, *Herminium*, *Cephalanthera*, *Spiranthes*, &c.

W. NORWOOD CHEESMAN, Esq., The Crescent, Selby, York, will be glad to receive or exchange specimens of *Mycetozoa.*

F. J. HANBURY, Esq., Brockhurst, East Grinstead, is anxious to have seeds of rare British plants. He will defray expenses.

Mr A. E. WADE, Botanical Department, the University of Cardiff, is contemplating the preparation of a Flora of Monmouthshire, and would be glad of assistance.

CORRECTIONS AND ADDITIONS, 1920 & 1921 REPORTS.

Report 1920.

p. 6. Line 12. For " Melville " read " Melvill."
p. 10. Line 29. For " Norfolk " read " Suffolk."
p. 27. Line 16. Under LAGOSERIS add " See *Rep. B.E.C.* iv., 419."
p. 33. Line 12. *Solanum nigrum* L., var. *sinuatum*. This is previously described as var. *atriplicifolium*.
Line 34. LINARIA RETICULATA Desv. is more correctly L. PINIFOLIA (Poir.) Thell. in Fedde Rep. Sp. Nov. 291, 1912.
p. 35. Line 17. Under VERONICA ORIENTALIS add " See also *Rep. B.E.C.* v., 571."
p. 82. Line 22. For " latter " read " former."
p. 85. Line 22. For " *viridescens* " read " *virescens*."
p. 95. Line 22. For " 1862 " read " 1858."
Line 29. For " which " read " that for 1862."
p. 109. Line 26. For " Park " read " Herts."
p. 124. Line 25. For " Syredale " read " Syradale."
p. 128. Line 10. For " Beaguoy " read " Beauquoy."
p. 139. Line 7. For " Syredale " read " Syradale."
p. 155. Lines 3 and 28. For "Darkadale" read "Durkadale."
p. 158. Lines 13 and 21. For " Glasgow " read " Leith."
p. 221. Line 26. Add " not *macrophylloides* but a *hirtifolius* form."
p. 222. Line 12. *R. Borreri* (Four Shire Stone) is wrong. The plant, a single bush, looks very near *sertiflorus*, but can hardly be that. I cannot give it a certain name at present. Its place seems to be among the

Radulae or *Sub-Koehleriani* of Rogers.—H. J. Riddelsdell.

p. 251. Line 6. For " August " read " July."

p. 254. Line 9. For " Darkadale " read " Durkadale."

Report 1921.

p. 266. Line 18. For " minute " read " rare."

p. 275. Line 17. Add after Edinburgh " where it was sown in 1822."

p. 283. Line 15. Add " See *Rep. B.E.C.* iv., 198."

p. 293. Line 7. For " *pulmonarium* " read " *pulmonarioides.*"

p. 308. Line 22. Delete " var. *leptochila.*"

Line 25. For " it " read " *leptochila.*"

p. 318. Line 28. For " var." read " × ."

p. 371. Line 10. For " *dicipiens* " read " *decipiens.*"

p. 401. Line 16. For " Hants " read " Surrey."

p. 457. Line 14. For " Sullum " read " Sullom."

Line 23. For " Voe " read " Hill."

p. 461. Line 21. For " *palustris* " read " *pratensis.*"

p. 469. Line 13. For " Bunya " read " Burga."

p. 480. Line 10. For " Surima " read " Swima."

p. 485. Line 14. For " Hamar " read " Kamar."

p. 497. Line 17. For " Brechin " read " Breakon."

p. 320. Line 27. For " S." read " Sporobolus."

p. 358. Line 14. Add " See *Journ Bot.*"

p. 374. Line 23. Add " Mrs Gregory now refers this to V. Riviniana × rupestris.

p. 381. Line 19. Add " Further specimens show that this Rose is not one of the *aciculatae.*"

p. 386. Line 19. " Shalford, S. Hants, Miss Todd " belongs to C. biennis and the locality is Shedfield.

p. 397. Line 16. For " *macrocarpa* " read " *microcarpa.*"

p. 547. Line 1. For " 1920 " read " 1921."

p. 552. Line 5. For " *R. alba* L." read " *R. lutea* L."

Lines 18 and 19. For "*Pesnaui*" read "*Pesneaui.*"

Lines 20 and 25. For " Shell-scully Links " read " shell-sandy links."

p. 555. Line 35. *R. pubescens*, var. *subinermis* (Wimbledon Common). There is certainly some *macrophyllus* in this distribution. The whole had better be destroyed, unless members can make the correction for themselves. I do not know how the mixture occurred. Both plants grow on Wimbledon Common.—H. J. RIDDELSDELL.

p. 558. Line 35. The entry should read *R. Godroni* (not *argenteus*), var. *robustus*.—H. J. RIDDELSDELL.

p. 574. Line 10. For "Orkney" read "Shetland."

4 JUL [illegible]

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(CONVENIENTLY ABBREVIATED REP. B.E.C.)

BY THE

EDITOR AND DISTRIBUTOR,

L. V. LESTER-GARLAND, M.A., F.L.S.

VOL. VI. PART VI.

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REPORT OF THE DISTRIBUTOR FOR 1922.

For the year 1922 contributions were received from 31 members of the Club. The number of sheets sent in was 4903, representing 393 different gatherings. The numbers contributed by individual members ranged from 11 to 931, the Secretary being responsible for by far the largest parcel. The names of several well-known contributors are absent from the list and on the other hand we have to welcome the accession of two new ones.

Most of the material was satisfactory, and some of the specimens were models of all that dried plants ought to be; but there was a small proportion that was worthless, consisting either of mere scraps or of material so carelessly prepared as to give no idea of the species. Bad material is worse than useless, especially in the case of critical plants: it is a source of error and confusion. It is, in my opinion, a mistake that such shall be preserved, either in public or in private herbaria. Like many other Distributors, I feel it incumbent upon me to call the attention of all Members once more to the excellent Rules of the Club. In particular, it is practically useless to send in a very small number of sheets of a species. This year, in many cases, there were only three. Unless there was some special reason for their inclusion they have been omitted from the *Report*. Such small parcels are absorbed at once by the officers of the Club and Referees, and the plants never reach the ordinary Members at all. They are only excusable to establish a new record in cases where no more material is available.

The thanks of the Club are due to Messrs W. Barclay, A. Bennett, C. E. Britton, J. Cryer, Dr E. Drabble, Dr G. C. Druce, Messrs J. Fraser, J. Groves, W. H. Pearsall, H. J. Riddelsdell, C. E. Salmon, and Col. Wolley-Dod for their kind notes upon critical plants. Very few comments were received from any but the recognised authorities; but it is worth considering whether the Club would not gain if more Members sent in notes to be dealt with by the Editor of the *Report* at his discretion. Some of them could hardly fail to be of sufficient interest to justify their being printed.

L. V. Lester-Garland.

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LIST OF PARCELS RECEIVED.

W. C. Barton,	376
S. H. Bickham,	25
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Thalictrum minus L., var. Root from Ben Bulben, Sligo, July 1922.—G. C. DRUCE.

T. eu-minus, var. a *maritimum* E.B. Sandy banks on the sea-shore, Traeth Crugan, two miles S.-W. of Pwllheli, S. Carnarvonshire. Coll. C. BAILEY, July 21, 1880; comm. G. C. DRUCE. (=*T. dunense* Dumort.)

Myosurus minimus L. Chertsey Mead, Surrey, June 22, 1922. Coll. C. A. COOK; comm. W. BIDDISCOMBE. Also from Old Drove Road, Curry Rivel, Somerset, v.-c. 5, June 1922.—H. DOWNES.

Ranunculus repens L. Form with 8 petals. Bourne, Lincs, August 25, 1922.—A. WEBSTER.

R. acris L., var. *pumilus* Wahl. Shipham Bottom, Mendip, North Somerset, v.-c. 6, August 5, 1907. Coll. C. BUCKNALL. "By Rouy and Foucaud and by F. Townsend *pumilus* is placed under *rectus*; but while some examples resemble that variety, others favour *tomophyllus* in the shape of their leaves; and all are nearer to the latter in the densely hairy stem and petioles. . . . In long moist herbage this apparently passes into *tomophyllus*.' *Fl. Brist.* It is possible, therefore, that our Mendip form is merely a state induced by local conditions. Dr Druce, in his *List of British Plants*, allots *pumilus* Wahl. solely to the Cairngorms. The Scotch plant (I have not seen it) is perhaps more stable than this from Somerset, determined by the late C. Bucknall.—JAS. W. WHITE. "Not the var. *pumilus* Wahl., which is a high alpine plant from the Cairngorms, with the lower leaves recalling those of *bulbosus*"—G. C. DRUCE.

R. acris L., var. *rectus* Jord. Filton Meads, West Gloucester, v.-c. 34, June 28, 1907, and Axbridge, North Somerset, v.-c. 6, June 19, 1908, legit C. BUCKNALL. Very like Townsend's specimens from Haslemere, distributed in 1900. Compare Reichb. *Ic.* t. 17, f. 1406, where the leaves have very cuneate lobes narrow at the base and with acute teeth. The late Mr Bucknall accumulated a quantity of material (which now has to be dispersed) while we were attempting to classify the forms of this polymorphous species that grow around Bristol. To my mind this is too good for the dustbin, and so I have written labels from notes on the drying tickets and am offering a selection to the Club.—JAS. W. WHITE.

R. bulbosus L. Small sand-dune form. Hall Road dunes, S. Lancs, v.-c. 59, May 30, 1922. Similar to the form sent from Formby in 1913. I cannot see how it differs from Mr Druce's var. *dunensis*, except that the pubescence is more dense and less spreading.—J. A. WHELDON. "This differs from my var. *dunensis*, which is abundant on the sand-dunes about St Ouen's Bay, Jersey, in its smaller flowers and more deeply incised leaves. I am inclined to believe that the so-called *R. Aleae* of the *Cambridge Flora* was an accidental variation of my *dunensis*, in which the corm was obsolete. Out of the thousands I have since examined in Jersey, I never found a cormless plant, nor has Mr Attenborough."—DRUCE.

Eranthis hiemalis Salisb. Old chalk pit, South Pickenham, v.-c. 28, February 26, 1922.—F. ROBINSON.

Paeonia corallina Retz. Origin: Steep Holm Island; cult. Ledbury, May 22, 1922. In 1919 I distributed specimens which had been gathered from the wrong plant and were *P. peregrina*. I now send specimens gathered from the right plant, *fide* Mr J. W. White.—S. H. BICKHAM.

Capnoides claviculata Druce. Rocks in Festiniog Valley, Merioneth, v.-c. 48, September 13, 1922.—W. C. BARTON.

Fumaria ——— [11]. Cultivated ground, Castlemorton, Worcs, v.-c. 37, September 5, 1922.—T. J. WALL. "A form of *F. Boraei* Jord. near var. *gracilis* Pugsley."—PUGSLEY.

Erophila serrata Jord.? [1937]. Field, Berechurch, N. Essex, v.-c. 19, April 2, 1922. Stem and silicules tinged with purple; leaves dull green; flowers 5 mm. diam.; silicules 6-7 mm.; about 22-27 seeds in each loculus; hairs 2- and 3-fid.—G. C. BROWN.

E. majuscula Jord. [1938]. Sea-wall by R. Colne, Colchester, v.-c. 19, April 20, 1922. Stems slightly purplish, spreading; about 15-18 seeds in each loculus; hairs 2- and 3-fid. This would seem to be almost the typical *E. majuscula* Jord.—G. C. BROWN. "Jordan's *majuscula* has flowers 6-7 mm. diam.; petals 3 times longer than the calyx; silicles 7 mm. long and 2½-3 mm. broad; leaves broad, ovate, acute, coarsely toothed, hairy, with the majority of the hairs 2-3-fid, etc. Mr Brown's plant is scarcely this."—SALMON.

Sisymbrium orientale L. [1947]. Waste ground, Hythe Quay, Colchester, v.-c. 19, May 18, 1922.—G. C. BROWN. "Yes. The forma *irioides* Thell."—THELLUNG.

S. [*altissimum* L.]. Waste ground off Lealand Road, Chester, v.-c. 58, July 29, 1922.—C. WATERFALL. "This is *S. orientale* L."—DRUCE.

S. Thalianum Gay.? alpine form or var. At 2000 ft. on Upper Silurian (Coniston Grit) rocks in a ravine on Cautley Crag, near

Sedbergh, July 12, 1922. I have secured seeds, and hope to see the result of garden cultivation next year.—A. WILSON. "An extraordinary form, which I refer to *Thalianum*, and from a locality 500 feet higher than that given in the *Student's Flora*. It is not the var. *pusilla* E. Petit, which has a simple stem: in this it is copiously branched. It is most desirable to cultivate it.—DRUCE. "Yes; *Stenophragma Thalianum* Celakovsky (*Arabis Thaliana* L. *Sisymbrium Thalianum* Gay). Willkomm (*Prod. Fl. Hisp.* iii., 804) says that it ascends to 8000 feet on the Sierra Nevada. Rouy says 'souvent presque naine.'"—LESTER-GARLAND.

Erysimum cheiranthoides L. West Sedgemoor, Curry Rivel, Somerset, v.-c. 5, in abundance, August 1922.—H. DOWNES. Also from cultivated ground, N. Somerset, v.-c. 6, July 15, 1922.—Miss IDA M. ROPER.

E. repandum L. North Stoke, Oxon, June 1922.—G. C. DRUCE.

Brassica monensis Huds. On the sand-hills at the west end of the Green, Lytham, W. Lancs, July 25, 1908. Coll. C. Bailey: comm. G. C. DRUCE.

B. Cheiranthus Vill. St Ouen's Pond and West Mount, St Helier's, Jersey, June 2, 1922.—L. CUMMING.

Diplotaxis muralis DC., var. *Babingtonii* Syme. By the sides of the railway between Freshfield and Ainsdale, near Southport, S.-W. Lancs, September 21, 1883. Coll. C. Bailey: comm. G. C. DRUCE.

Capsella Bursa-pastoris L., sub-sp. *laevigata* E. Almquist. [1946.]. Waste ground, Hythe Quay, Colchester, v.-c. 19, May 18, 1922.—G. C. BROWN.

C. Bursa-pastoris L., sub-sp. *Druceana* E. Almquist. [1944.]. Roadside, W. Mersea, N. Essex, v.-c. 19, May 14, 1922.—G. C. BROWN.

C. Bursa-pastoris L., sub-sp. *gallica* E. Almquist. (?) [1945.]. Waste ground, Hythe Quay, Colchester, v.-c. 19, May 10, 1922. Seems nearest to sub-sp. *gallica*, but the notch of capsule is deeper and the lobes more rounded than in any examples of the Club gatherings passed by him, or than his description (*Rep. B.E.C.* 204. 1920) would seem to allow."—G. C. BROWN.

Lepidium ruderale L. (1.) Exmouth, Devon, by the Docks in great quantity, a recent introduction. [1520]. July 31, 1922.—W. S. M. D'URBAN. "Yes."—DRUCE. (2.) Waste ground at Ilminster, Somerset, v.-c. 5, July 1922.—H. Downes. "Yes; not in *Top. Bot.* for v.-c. 5."—Druce. (3.) Waysides, Putney Hill, July 28, 1922.—H. E. Fox. "Yes."—Druce.

L. heterophyllum Benth., var. *alatostylum* Towns. Grouville Common, Jersey, June 7, 1922.—L. Cumming. "Yes; and a new variety for the Channel Islands."—Druce.

Thlaspi arvense L. Potato patch, Spurn Head, E. Yorks, v.-c. 61, September 9, 1921.—C. Waterfall.

Teesdalia nudicaulis Br. Ambersham Common, Sussex, May 13, 1922.—R. J. Burdon.

Raphanus maritimus Sm. (1.) St Ouen's Pond, Jersey, June 2.—L. Cumming. (2.) Barna and Grattan Road, Co. Galway, Ireland, August 24 and October 20, 1922.—D. J. Evans.

Reseda alba L. Waste ground, Barry, v.-c. 41, July 1922. This plant is quite at home in its Barry habitat. There were a couple of hundred plants, all seeding abundantly, more than holding their own.—R. L. Smith. "Yes."—Druce.

Viola Riviniana Reichb., var. *diversa* Greg. Highwood, Patchway, W. Gloster, v.-c. 34, May 2 and June 23, 1922.—Miss Ida M. Roper.

V. tricolor L., var. *Lloydii* (Jord.), fide W. G. Travis, who saw all these specimens on October 27, 1922. [2111.]. Border of an oat field, Bigging, Birsay, Mainland, Orkney. Not native; a weed of cultivation, September 8, 1922.—H. H. Johnston. "This is not the least like *Lloydii*. I am not yet prepared to identify these Orkney plants with any continental pansies."—Drabble.

V. arvensis Murray, var. *obtusifolia* (Jord.), fide W. G. Travis. [2112.]. Border of an oat field, Bigging, Birsay, Mainland, Orkney. Not native; a weed of cultivation, September 8, 1922.—H. H. Johnston. "This is not *obtusifolia* Jordan. (In any case the citation *V. arvensis* Murr., var. b. *obtusifolia* Jordan is incorrect.). The plants appear to be rather large *V. derelicta* Jord. It seems a pity that elaborately printed labels with incorrect determinations should pass into circulation."—Drabble.

V. ———? [Z 999.]. Marcham, Berks, July 1922.—G. C. Druce. "This is *Viola obtusifolia* Jord."—Drabble.

V. ———? [Z 7.]. Headington, Oxford, May 1922.—G. C. Druce. "This is *V. variata*, var. *sulphurea* Drabble."—Drabble.

Polygala dubium Bellynck. The Quenvais, Jersey, April 1921.—G. C. DRUCE. "I should like to see a good series in flower and fruit; the leaf texture and shape are remarkable."—SALMON.

Silene anglica L., var. *quinquevulnera* (L.). West Mount, St Helier's, Jersey, June 7, 1922.—L. CUMMING.

Cucubalus baccifer L. Grown from seed gathered on rocky ground near the sea in 1920 at Woody Bay, N. Devon, September 1922.—H. E. FOX.

Cerastium arvense L. Shingly beach, Salthill and Penmore, Galway, Ireland, July 9 and October 9, 1922.—D. J. EVANS. "This is an interesting plant, intermediate as it is between Syme's var. *Andrewsii* which, contrary to certain critics (*Rep. B.E.C.* ii., 441), he describes as having leaves sub-glabrous, ciliated, rigid, somewhat recurved, with the midrib very strong and prominent, and cymes usually reduced to a single shortly-stalked flower. The Galway plant agrees with the description, and also with Syme's type in my possession, in the vegetative characters, except that the plant is a little larger, but the cyme is three-flowered. On the other hand it is nearer *Andrewsii* than it is to the var. *glabrescens* M. & K."—DRUCE.

Spergularia salina Presl. [2005.]. Marsh between the Loch of Ayre and Bay of Ayre, Holm, Mainland, Orkney, August 20, 1922.—H. H. JOHNSTON.

Polycarpon tetraphyllum L. Weed on gravel path, Watton, v.-c. 28, August 4, 1922.—F. ROBINSON. "This is the form *a laxum* of Rouy & Foucaud's *Flore de France*, iii., p. 312, which alone occurs in Britain, although var. *diphyllum* DC. is also found in Jersey. If the plant is wild at Watton, it is, I think, a new v.-c. record, and a notable extension of the range of the species."—PUGSLEY.

Montia ————. Dry hillside, Polperro, v.-c. 2, May 13, 1922.—F. RILSTONE. "Is *M. verna* Necker."—DRUCE.

Hypericum hirsutum L. Lemon-coloured flowers. In some quantity on the open downs at Box Hill, Surrey, with the more usual form, July 4, 1922.—H. J. RIDDELSDELL. "The pale-flowered form is by no means rare."—DRUCE.

H. Desetangsii Lamotte. Root from Lewes, Sussex; hort. Oxford, July 1922.—G. C. DRUCE.

Althaea officinalis L. Near West Dean, Sussex, August 4, 1922.—W. BIDDISCOMBE.

A. hirsuta L. Headington, Oxford, September 1922.—G. C. DRUCE. Also from T. J. WALL, ibid., June 15, 1922. " A most interesting discovery of Mr Wall's. Later in the season Mr T. Gambier-Parry also found it in the same place and showed it me. It certainly was not there in 1912. It is remarkable to find so much of it in so short a period. The farmer who occupies the land tells me he had pigs on the ground a few years ago, and he gave them some foreign corn. This may be the method of introduction, although now it has the appearance of being native, its companions being indigenous plants, including an abundance of *Erigeron acre*. In another part of the area is a patch of *Euphorbia Cyparissias*, also a recent arrival."—DRUCE.

Linum angustifolium Huds. Hayling Island, June 25, 1922.—R. J. BURDON. " My specimen is *L. usitatissimum*, a very distinct species."—RIDDELSDELL.

Geranium molle L. Albino. Delamere Forest, Cheshire, v.-c. 58, May 27, 1922.—C. WATERFALL. " Albino forms of *G. molle* are not rare."—DRUCE.

G. Robertianum L., var. Calcareous soil, Llyn Clech Owen, Carmarthen. Coll. D. HAMER ; comm. G. C. DRUCE.

G. Endressi Gay. Near Patshull, Staffs, July 1922.—G. C. DRUCE & Lady JOAN LEGGE. " Only known from a small district in the Western Pyrenees, where it was discovered by Endress in 1831. Near *G. palustre* L. It has been long in cultivation."—LESTER-GARLAND.

Erodium maritimum L'Hérit. In great abundance on a limestone hill to the S.-W. of Little Orme's Head, Llandudno, N.-E. Carnarvon, September 17 and 27, 1879. Coll. C. BAILEY ; comm G. C. DRUCE.

E. moschatum L'Hérit. Sea-wall, Rumney, Monmouth, v.-c. 35, June 1922.—A. E. WADE. " Appears to be a new county record for Monmouth."—DRUCE.

Impatiens parviflora DC. Garden weed, Putney. August 1922.—H. E. FOX.

I. glandulifera Royle. River banks above Maentwrog, Merioneth, v.-c. 48, September 7, 1922.—W. C. BARTON. " Yes ; I have not seen a record for Merioneth before."—DRUCE.

Acer Pseudo-Platanus L. Leaves of unusual size, measuring 12 by 11 inches in the largest example. From a young tree growing in rich soil at Meole Brace, Salop, v.-c. 40, August 1922.—J. C. Melvill.

A. campestre L. From ancient trees of unusually commanding height, 50 feet or more, Cranborne Chase, Dorset, v.-c. 9, July 1922. —J. C. Melvill. "This is the type = var. *hebecarpum* DC., having downy samaras."—Druce.

A. campestre L., var. *hebecarpum* DC., sub-var. *dissectifolium*. [X 1060.]. Princes Risborough, Bucks.—G. C. Druce. Also sub-var. *purpurascens* Legr. Chinnor, Oxon, September 1922.—G. C. Druce.

A. campestre L., var. *leiocarpon* Wallr. Roath, Cardiff, Glamorgan, v.-c. 41, June 1922.—A. E. Wade. "Correctly named."—Druce. Also sub-var. *purpurascens* R. & F. [Z 1059.]. Princes Risborough, Bucks, September 1922.—G. C. Druce.

Medicago silvestris Fries. Edges and sides of cliffs north of Cromer, E. Norfolk, July 20, 1891. Coll. C. Bailey; comm. G. C. Druce.

M. sativa L. [1940.]. Yellow-flowered form, with small form of type, on waste ground by maltings, Hythe Quay, Colchester, N. Essex, v.-c. 19, July 30, 1922. Flowers rather deep yellow, some tinged with purple. Only one immature pod—a distinct spiral. I have seen no *falcata* in this locality or in the district.—G. C. Brown. "Not *M. sativa*, but apparently *M. silvestris* Fries."—Britton. "Is not this the hybrid, *M. varia*?"—Druce.

Melilotus alba Desr. Fruits. G.N. Railway, above engine sheds, Hitchin, Herts, v.-c. 20, September 17, 1922.—J. E. Little.

M. arvensis Wallr. Fruits. G.N. Railway, above engine sheds, Hitchin, Herts, v.-c. 20, 1921 and 1922.—J. E. Little.

Trifolium Bocconi Savi. Gew Graze Valley, Lizard, Cornwall, v.-c. 1, June 1921.—H. Downes.

T. procumbens L., var. *majus* Koch. Cultivated ground near Malvern, Worcester, v.-c. 37, September 18, 1922.—T. J. Wall. "This has the large golden heads of flowers apparently, but the peduncles do not agree well with Koch's diagnosis—'pedunculis folia aequantibus vel haud multum longioribus.'"—Salmon. "Koch himself (*Syn.* ed. 3, p. 153) says that all the characters given to distinguish his α. *majus* (=*T. campestre* Schreb.) and β. *minus* (= *T. procumbens* Schreb.) are very variable and that intermediate forms are everywhere found. Some of these characters are inconstant even on one individual plant."—LESTER-GARLAND.

Anthyllis Vulneraria L., var. *maritima* Koch. [1435.]. Exmouth, Devon, at the base of the sea cliffs of Red Marl of the Trias, June 8, 1922.—W. S. M. D'URBAN. "Agrees in having a copious depressed pubescence with *A. maritima* Schweig., which is reduced to a variety by Koch."—DRUCE.

Astragalus glycyphyllos L. (1.) Hog's Back, above Puttenham, Surrey, June 22, 1922.—W. BIDDISCOMBE. (2.) Dog's Hill, Ledbury, Herefordshire, v.-c. 36, June 28, 1922.—C. WATERFALL.

Scorpiurus subvillosa L. Sand heap, Radyr, v.-c. 41, June 1922. —A. E. WADE. "Correctly named. It is a South European alien." —DRUCE.

Ornithopus perpusillus L. Radyr, Glamorgan, v.-c. 41, June 1922.—A. E. WADE.

O. pinnatus Druce. Scilly Isles, v.-c. 1, June 1922.—H. DOWNES. "Yes; it is pleasing to find that it still occurs in the Scillies. It is now very rare in Guernsey."—DRUCE.

Vicia silvatica L. Plentiful on the wooded banks of the Whiteadder Water, one mile south of Foulden, near Ayton, N.E. Berwick, July 18, 1900. Coll. C. BAILEY; comm. G. C. DRUCE.

V. bithynica L. [1433.]. Exmouth, Devon, at the base of the Red Marl cliffs along the sea front, June 8, 1922.—W. S. M. D'URBAN.

V. Orobus DC. Rocky woods, Devil's Bridge, Aberystwyth, v.-c. 48, June 22, 1911.—L. CUMMING.

Prunus domestica L. Hedge in Kilsby Village, Northants, April 6 and May 22, 1922.—L. CUMMING. "Can this be correct? The leaves, though not mature, are small, with very neat serrations, and are thin in texture. On the evidence supplied I should query it (if a British plant) as *P. insititia*."—DRUCE.

P. domestica × spinosa. [1.]. Lane near Old Rifle Butts, Hitchin, Herts, May 5 and September 4, 1922.—J. E. LITTLE.

Rubus.—Most of the *Rubi* sent out by me have been made up into parcels assigned to members who are known to want *Rubus*. It would be a gain to both Barton and myself if all who want *Rubus* would send me a list of desiderata, or a corrected list. Barton and I worked together in 1922 for three or four days in Surrey, one on Shooter's Hill, and three or four at Portmadoc (v.-c. 48 and 49). We send out many gatherings which we made in company, as well as many made apart. The notes represent our agreement. Where we are not in agreement, gatherings are kept back for the present.—H. J. RIDDELSDELL.

R. fissus Lindl. [581.]. Festiniog Valley, Merioneth, September 13, 1922.—W. C. BARTON. "Yes; very typical. Gathered here in 1848 by Edwin Lees."—RIDDELSDELL. Also from Brandon Wood. "Quite typical."—RIDDELSDELL.

R. Rogersii Linton. [621.]. Denham Golf Links, Bucks, June 21, 1922.—W. C. BARTON. "Yes; and very close to *R. ammobius* Focke, which Focke (1914) puts in a subordinate position to *Rogersii*. The living plant in the flowering stage is needed to establish *ammobius* with security. *Rogersii* was recorded from Bucks (Hawke Wood) some years ago by Benbow. I can see no reason for Sudre's very close association of *Rogersii* with *affinis*."—RIDDELSDELL.

R. opacus Focke. Abrook Common, in plenty; scarcer on Littleworth Common, July 1922.—W. C. BARTON & H. J. RIDDELSDELL. "Pink-flowered form. Sudre agrees with Focke in placing *opacus* nearer to *plicatus* than to *nitidus*. But Sudre (1908) thinks most of our English *opacus* comes under *nitidus*, thus differing from Focke's plant. Focke (1914), however, reasserts his original view, which identifies our *opacus* with his German plant; and as he saw it growing, whereas Sudre (I gather) has only seen *exsiccata*, it seems safer to follow him. Focke, however, places *opacus* (on an equality with *ammobius*) under *Rogersii*, and thinks it a highly probable hybrid of *plicatus* and *affinis*, though he admits that it frequently grows where these do not. At Abrook we saw neither *plicatus* nor *affinis*."—RIDDELSDELL.

R. holerythros Focke. In great quantity on Witley Common and by Frensham Pond, also on Walton Heath and many other places in Surrey, July 1922.—H. J. RIDDELSDELL.

R. carpinifolius Wh. & N. Brandon Wood, v.-c. 38, September 1922, stems unusually upright.—H. J. RIDDELSDELL.

R. incurvatus Bab., var. *subcarpinifolius* Rogers MS. Putney Heath and in many other spots in Surrey, especially near Guildford.—W. C. BARTON & H. J. RIDDELSDELL. "This is, as I understand, the plant to which Rogers applied this name. It differs very slightly indeed from ' the usual S. England form ' (*Handbook* p. 27). which has rounder leaflets than the Wye Valley form. Indeed, I strongly suspect that the Putney Heath plant is the S. England form of Rogers, but I have no good description of the latter, and I could find no good specimens of it in Rogers' herbarium. At present I am disposed to treat the two as one and the same thing, differing abundantly from *incurvatus* in the direction of *carpinifolius*."—RIDDELSDELL.

R. Lindleianus Lees. Brandon Wood, v.-c. 38, September 1922, in deep shade.—H. J. RIDDELSDELL.

R. argenteus Wh. & N. Walton Heath and Reigate Heath, Surrey, July 1922. On the heaths and commons near London it is far more glandular than in the more distant localities. Also f. *eglandulosa* from Tidenham Chase, v.-c. 34. Coll. Mrs WEDGWOOD; comm. H. J. RIDDELSDELL. Also from Littleworth and Abrook, 1921. " This species is most puzzling as it occurs on the Surrey Commons. We sometimes mistook it for *rhombifolius*, especially at Abrook. These sheets are, however, the London form of *argenteus*, much less glandular than usual."—RIDDELSDELL.

R. Bakeri F. A. Lees. Quite prostrate, on edge of wood, Brandon, v.-c. 38, September 1922. I cannot see why this should be associated with *rhamnifolius* as a variety, except for the length of petiolule of the terminal leaflet. I believe Rogers eventually thought this too. Also in small quantity on Witley Common, v.-c. 17.—H. J. RIDDELSDELL.

R. dumnoniensis Bab. Portmadoc, v.-c. 49, in small quantity. I cannot agree with Sudre in associating *dumnoniensis* with *pyramidalis*.—H. J. RIDDELSDELL.

R. pulcherrimus Neum. Earlswood Common, Surrey, July 1922. A very frequent species in the county. Also Brandon Wood, September 1922, and in quantity about Portmadoc, August 1922.—H. J. RIDDELSDELL.

R. villicaulis Koehl., var. *calvatus* Blox. Whitley and Thursley Commons, Surrey, July 1922. Magnificent bushes, with very large flowers, not in great quantity.—H. J. RIDDELSDELL.

R. Selmeri Lindeb. Roadside, Lexden, N. Essex, v.-c. 19, July 10, 1922.—G. C. BROWN. " Yes: typical."—RIDDELSDELL. Also from Brandon Wood, in quantity.—H. J. RIDDELSDELL.

R. ramosus Briggs. Littleworth Common, July 1922.—H. J. RIDDELSDELL.

R. Godroni Lec. & Lam., var. *clivicola* Ley. Bloxham, v.-c. 23, September 16, 1922. Occupying an area of several acres on a hill-slope in Bloxham parish. The plant is admirably true to type, though the leaflets often run big."—H. J. RIDDELSDELL.

R. pyramidalis Kalt. Small form (= *R. eifeliensis* Focke). Open, bushy ground, Beacon Hill, Monmouth, August 1922. A very abundant, curious and pretty form, with singularly broad cylindrical panicle.—H. J. RIDDELSDELL.

R. macrothyrsus Lange. Portmadoc, Carnarvon, v.-c. 49.—W. C. BARTON & H. J. RIDDELSDELL. "Common and most beautiful in both v.-c. 48 and 49. We were disposed to ask whether this is not the *leucostachys* from Tremadoc recorded in Griffiths' *Flora*. I do not think I saw true *leucostachys* at Portmadoc."—RIDDELSDELL.

R. leucanthemus P. J. Muell. Oxshott Heath, Merrow Down, etc., Surrey. This is the plant which Rogers refers to the above *with the query*. Focke (1914) says that Mueller described *leucanthemus* from a single bush of *vestitus* (the name which Focke prefers to *leucostachys*) observed near Weissenburg. Sudre simply differentiates it from *leucostachys* by its white flowers and less imperfect pollen, and by its being found on calcareous as well as siliceous soils. If that is so, our plant is not *leucanthemus* Muell. It is as distinct from *leucostachys* as *macrothyrsus* is. It needs, therefore, a name, unless it has been already described under some other name.—H. J. RIDDELSDELL.

R. lasioclados Focke, var. *angustifolius* Rogers. Putney Heath, in quantity, July 1922.—W. C. BARTON & H. J. RIDDELSDELL. "Under this form, though the very long parallel-sided terminal leaflets of the Western plant are of rare occurrence on Putney Heath, where the form abounds."—RIDDELSDELL.

R. anglosaxonicus Gel., var. *vestitiformis* Rogers. Wood edge, Taddington, v.-c. 33, August 22, 1922. Abundant and typical in many respects, but with curiously variable leaflets, besides being only sparingly glandular. The colouring, however, is very close to *anglosaxonicus*.—H. J. RIDDELSDELL. Of the plant from Putney Heath sent out under this name Mr Riddelsdell writes:—"I am inclined to think that this should rather go under *leucostachys*, in spite of features which take it off to *vestitiformis*. The prickles are so slender and the glandular development so slight as to justify the revision of the name. We cannot yet, therefore, reckon *vestitiformis* as a Surrey plant."

R. infestus Weihe. Witley Common (in quantity), Thursley Common, Merrow Down, and other places. A frequent plant in

Surrey, July 1922.—H. J. RIDDELSDELL. Also var. *virgultorum* (Ley). Near Horsepath, Oxon, July 1922.—G. C. DRUCE. "This is *R. infestus*, var. *virgultorum* Ley, quite typical. There is a preponderance of very small stem leaves, but in every essential it agrees exactly with the specimens of *virgultorum* in my herbarium from Shropshire, Herefordshire, Worcestershire, and Cheshire. Rogers MS. Records Book only gives Monmonth and Brecon in addition, so that Oxfordshire is a remarkable outlier in the distribution of this form."—RIDDELSDELL.

R. uncinatus P. J. Muell. Woods near Monmouth, plenty of it, September 1922.—H. J. RIDDELSDELL.

R. Radula Weihe. Weak form, near type, Les Marais and Fauvic, Jersey, July 12, 1897. Coll. W. M. ROGERS; comm. H. J. RIDDELSDELL.

R. echinatus Lindl. Oxshott Heath, a small form.—H. J. RIDDELSDELL.

R. rudis Wh. & N. Reigate and Walton Heaths, Surrey, July 1922. At one spot adjoining bushes differed so greatly in size of flowers and general luxuriance—the large plant being much less glandular—that I wondered whether they could be specifically different. But, eventually, it seemed that there was no substantial difference, and both forms are put under *rudis*.—H. J. RIDDELSDELL.

R. oigoclados Rogers. Badby Wood, v.-c. 32. This seems the only possible name for the plant which occurs here with *R. rudis*, along with apparently intermediate forms.—H. J. RIDDELSDELL. Also var. *Newbouldii* Rogers. Portmadoc, Carnarvon, September 1, 1922.—W. C. BARTON & H. J. RIDDELSDELL. "Very good *Newbouldii*, with foliage unusually grey beneath. First record for N. Wales, and indeed for all Wales except 41 and 42. Focke associates this form closely with *R. mucronatus* Blox.; Sudre with *R. apiculatus* Weihe (*i.e.*, *anglosaxonicus* Gel.); but I cannot help thinking that its true affinities are with the *Radulae*, as in Rogers' *Handbook*."—RIDDELSDELL.

R. Griffithianus Rogers. Cooper's Hill, Surrey. I can assign this to nothing else. N.C.R.—H. J. RIDDELSDELL.

R. melanodermis Focke. Wimbledon Common, July 12, 1922.—W. C. BARTON & H. J. RIDDELSDELL. "First found in 1921, and there mistaken for *Bloxamii*. (See Rogers' *Handbook* for the likeness.). The plant escaped the disastrous fire of 1921, and we found it again in better condition, and are sure of its identity. This is a great extension of its range—S. Devon, Dorset, [N.] and S. Hants, [E. Gloster], W. Gloster, Glamorgan. The form is not absolutely typical."—RIDDELSDELL.

R. ericetorum Lefèv., var. *cuneatus* Rogers & Ley. Taddington, v.-c. 33, August 1922. Substantially identical with the S. Wales plant. In great quantity over a limited area. Hitherto known only from N. Somerset, Monmouth, Glamorgan, and Breconshire.—H. J. RIDDELSDELL.

R. Bloxamii Lees. Brandon Wood, v.-c. 38, September 1922. In great quantity, and mostly very constant.—H. J. RIDDELSDELL.

R. fuscus Wh. and N., var. *nutans* Rogers. Walton Heath and Oxshott Heath, July 1922.—H. J. RIDDELSDELL.

R. pallidus Wh. and N. [633]. Denham Golf Links, Bucks, June 25, 1922.—W. C. BARTON. "Yes; very strong, but good and typical."—RIDDELSDELL. Var. *leptopetalus* Rogers. From Tackley Copse, v.-c. 23; Putney Heath, v.-c. 17, and Eltham, v.-c. 16, 1922. —H. J. RIDDELSDELL.

R. thyrsiger Bab. Pontyclun, and a new locality (under tall bracken) near Ystradowen, v.-c. 41, August 1922. Probably widespread in the neighbourhood.—H. J. RIDDELSDELL.

R. longithyrsiger Bab. Polperro, v.-c. 2, July 7, 1922.—F. RILSTONE. "I suppose so; but an unusually strong form with long-pointed leaflets."—RIDDELSDELL. Also from Crown Wood, Shooter's Hill, v.-c. 16, July 13, 1922. From Wolley-Dod's locality. See *Flora of Kent*. The wood abounds in Sub-Bellardians—*pallidus*, *leptopetalus*, *nutans* and this."—H. J. RIDDELSDELL.

R. rosaceus Wh. & N. Nutfield Common, v.-c. 23. Comes under the aggregate and fairly near type.—H. J. RIDDELSDELL.

R. dasyphyllus Rogers. Taddington, v.-c. 23, and Brandon Wood, v.-c. 38, August and September 1922.—H. J. RIDDELSDELL.

R. viridis Kalt. Walton Heath, Royal Common and Redhill, July 1922.—H. J. RIDDELSDELL.

R. serpens Weihe. Park Corner, v.-c. 23, July 1920. I name this with some doubt.—H. J. RIDDELSDELL.

R. hirtus Waldst and Kit., var. *rubiginosus* (P. J. Muell.). Wimbledon Common, July 12, 1921.—W. C. BARTON & H. J. RIDDELSDELL. "First found here by us in 1921. I believe the identification is correct. The plant agrees well with specimens so named by Rogers."—RIDDELSDELL.

R. dumetorum Wh. and N., var. *raduliformis* Ley. Bloxham, v.-c. 23, July 1922. Already recorded for Oxon, and probably commoner than records show.—H. J. RIDDELSDELL.

R. corylifolius Sm., var. *sublustris* (Lees). [624.]. Denham Golf Links, v.-c. 24, June 26, 1922.—W. C. BARTON. "Correct." —H. J. RIDDELSDELL.

R. caesius L., var. On the edge of a wood about a mile from Crondell, Hants, July 1922.—W. BIDDISCOMBE. "These pieces bear a very close resemblance to *R. saxatilis* L.; but stipules and sepals are those of *R. caesius* L., of which it is a form."—RIDDELSDELL.

Rubus ——? Brandon Wood, Warwick, August 25, 1922.—L. CUMMING. "A single plant in deep shade. I do not know what to make of it, but think it must be a hybrid, with *robustus* or some other Discolorean in it. Petals deep pink; stem remarkably blunt-angled."—RIDDELSDELL.

Potentilla argentea L. Didcot, Berks, July 1896.—G. C. DRUCE.

Poterium stenophyllum Jord. Roadside, Tickenham Hill, N. Somerset, June 20, 1922. A rare colonist in the county.—Miss I. M. ROPER. "Yes; *stenophyllum*, which I put as the type *P. polygamum*."—DRUCE. "Probably."—THELLUNG.

Rosa lutetiana Lem., var. *aspernata* (Déségl.). [2344.]. By the Avon, Ham Green, Pill, N. Somerset, June 30 and August 27, 1922. —Miss IDA M. ROPER. "Can hardly be called glandular biserrate, but perhaps nearer to var. *aspernata* than to any other var."—BARCLAY. "Certainly not *aspernata*. It is a rose allied to *R. canina*, var. *verticillacantha* Baker, but with no marked features. It comes nearest var. *Schottiana* Ser., but is not what I believe to be that variety."—WOLLEY-DOD.

R. andegavensis Bast., var. *agraria* (Rip.). [928.]. Twinstead, N. Essex, September 1922.—G. C. DRUCE. "Correct."—WOLLEY-DOD. "Doubtless a form of *R. andegavensis* Bast., but the specimen is too scrappy to say more."—BARCLAY.

R. micrantha Sm., forma. [Z 991.]. Whittlebury Forest. Northants, July 1922.—G. C. DRUCE. "A most peculiar and interesting plant, which may be *R. micrantha* × *arvensis*. I have seen leaflets like these in *R. micrantha*, but rarely, and never such inflorescence, which strongly recalls *R. arvensis* and looks barren. By far the most interesting of the Roses sent in. I hope it is the hybrid, as it will make the second endemic hybrid recently discovered—*R. micrantha* × *canina*, which Mr Britton distributed last year, being the first. Druce tells me that he is cultivating it, which may throw some light on it; but all Roses are most bewilderingly protean. —Wolley-Dod. "I suppose correct, but my specimen is only in flower, and shows no prickles."—Barclay.

R. tomentosa Sm., var. *Sherardi* (Davies), f. *leiostyla*. [941.]. Twinstead, N. Essex, April 1922.—G. C. Druce. "Yes. I now include *R. submollis* Ley as a synonym, with var. *uncinata* (= var. *pseudo-mollis* E. G. Baker) as a hooked-prickled form."—Wolley-Dod.

R. tomentosa Sm. [1485.]. Origin unknown. Has grown for many years in the garden, Newport, Countess Wear, near Exeter, June 6, 1922.—W. S. M. D'Urban. "This is near *R. dumosa* Pug., but so far as I can judge from the specimen it is at least equally near var. *confusa* (Pug.). The ends of flowering branches in flower are of little use for naming."—Wolley-Dod. "Agrees pretty well with *R. dumosa* Pug., so far as the characters of the specimen show. It would be desirable to have specimens in ripening fruit and showing better the prickle characters."—Barclay.

R. scabriuscula Winch. [Z 989.]. Whittlebury Forest, Northants, July 1922.—G. C. Druce. "Almost typical, but some of the leaflets are glandular enough for var. *silvestris* Woods. Winch is not a good authority for the name, since he certainly included *R. mollis* with it."—Wolley-Dod. "Correct, I think, but there are no prickles on my specimen."—Barclay.

R. omissa Déségl. Chilsbury, N. Wilts, September 1922. Coll. C. P. Hurst; comm. G. C. Druce. "Correct."—Wolley-Dod & Barclay.

R. insignis Déségl. & Rip. [1484.]. Waste ground in garden, Newport, Countess Wear, near Exeter. Probably a budding stock. June 21, 1922.—W. S. M. D'Urban. "More probably one of the Dumales than Transitoriae, but much too scrappy and young."—Wolley-Dod. "Possibly correct, but more advanced specimens should be sent."—Barclay.

Pyrus Aria Ehrh., var. *incisa*. (1.) On limestone rock, Clift n Down, Bristol, June 7 and 29, 1922. (2.) Leigh Woods, N. Somerset, May 31 and July 25, 1922.—Jas. W. White.

P. latifolia Syme, var. *decipiens* Bechst. Leigh Woods, N. Somerset. (See *Fl. Bristol* p. 307.). Leaves only, June 10, 1914; flowers, May 27, 1922; fruit, July 20, 1922.—Jas. W. White.

P. ————? Border of wood on the Cadbury ridge, near Clevedon, N. Somerset, May 18 and July 27, 1922. Foliage of this tree was contributed to the Club last winter in the hope that it might be identified with some known form of the *Sorbus* group. I can now forward flowers and fruit produced abundantly this season after many barren years, and trust that the opinion of some authority may be obtained. The late Augustin Ley might have suggested *P. intermedia*, with which it seems to me to have some affinity, but there is certainly a doubt. The peculiar hoariness is such as I have never before met with in any plant of the genus, and renders the tree conspicuous at a distance. I see in *Journ. Bot.* 288, 1910, a statement by A. Ley that the plant we have been calling *P. intermedia* Ehrh. in Britain is about to be described by Prof. Hedlund under another name. Does anyone know if that description was ever made?—Jas. W. White.

Crataegus monogyna Jacq. The glabrous-fruited form. Rare individual hairs are occasionally found on fruit. Bloxham, v.-c. 23, July 24, 1922.—H. J. Riddelsdell. "The var. *glabrata* Sonder, a name which antedates my var. *leiocarpa*."—Druce.

Cotoneaster Simondsii Baker. Roadside near Perranzabuloe Church, Cornwall, v.-c. 1, September 1922.—F. Rilstone. "Yes; the Himalayan *C. Simonsii* (not *Simondsii*)."—Druce. "A frequently cultivated shrub, records of which as an escaped plant are becoming more and more numerous. I have seen it in W. Gloster, v.-c. 34."—Riddelsdell.

Callitriche hamulata Kütz. In a pit near Brockenhurst Bridge in the New Forest, S. Hants, May 18, 1883. Coll. C. Bailey; comm. G. C. Druce.

Epilobium palustre L. Ippolyts Common, Herts, v.-c. 20, August 1922.—J. E. Little.

Oenothera Lamarckiana Ser. Short-styled form. On the sandhills on the north side of Beach Road, St Anne's-on-Sea, W. Lancs, August 3, 1907. Coll. C. Bailey; comm. G. C. Druce.

O. odorata Jacq. Origin: Sea sands at Bootle, 1921; hort. Kilsby, July 1922. Inadvertently named *O. stricta* on the specimens sent for distribution.—L. Cumming.

Bupleurum tenuissimum L. Common near Malvern, Worcester, v.-c. 37, August 30, 1922.—T. J. WALL. "A halophilous plant, only occurring inland where there is salt in the soil. Long known from this locality. Edwin Lees in "Pictures of Nature Round Malvern" 257, 1856, gives a list of a good many maritime plants (including the *Bupleurum*) which he says had but recently appeared on the banks of the Droitwich Canal which receives the waste brine from the springs and works and joins the Severn above Beverege. He raises the question whether these plants are the survivals of an earlier estuarine flora, or accidentally brought up by barges trading from Droitwich to Bristol and maintaining their existence under the conditions of a salt water marsh."—LESTER-GARLAND.

Apium inundatum Reichb. f. (1.) Carmarthen. Coll. D. HAMER; comm. G. C. DRUCE. (2.) Tan-y-Bwlch Lake, Merioneth, v.-c. 48, September 7. 1922. Growing in masses. with tips floating; water about two feet deep.—W. C. BARTON. "Yes; with the leaves cut into capillary segments."—DRUCE.

Carum verticillatum Koch. Near Canal, Woking. July 22, 1922.—W. BIDDISCOMBE. "The discovery of *C. verticillatum* in Surrey, otherwise an exclusively western plant in Britain. was announced by Mr C. E. Salmon in *Journ. Bot.* 300. 1908. He regards it as a genuine native."—LESTER-GARLAND.

Chaerophyllum aureum L. Root from Callander. Perth: hort. Oxford, 1922.—G. C. DRUCE.

Anthriscus [*officinalis*]. Waste ground. Beaumont. Jersey, June 2, 1922.—L. CUMMING. "*A. vulgaris* Pers."—LESTER-GARLAND.

Seseli Libanotis Koch. On turfy cliffs between Seaford and Cuckmere. Sussex, August 22, 1922.—W. BIDDISCOMBE.

Oenanthe pimpinelloides L. [1501.]. Newport. Countess Wear, near Exeter, July 15. 1922.—W. S. M. D'URBAN. "Correct."—RIDDELSDELL.

Æthusa Cynapium L., var. *agrestis* Wallr. Cornfield. Brandon. Warwickshire, v.-c. 38. August 25. 1922.—L. CUMMING. "Yes; cultivation is desirable to see if the characters are maintained under different conditions."—DRUCE.

Meum Athamanticum Jacq. Dillicar Common, near Grayrigg, Westmoreland, alt. 880 feet, July 25. 1922. Frequent in fields and by roadsides over a wide area in this neighbourhood.—A. WILSON.

Peucedanum graveolens Benth. & Hook. (*Anethum graveolens* L.). Marcham, Berks, July 1922.—G. C. Druce.

× *Galium ochroleucum* Wolf. Hayling Island, June 28, 1922.—R. J. Burdon.

G. erectum Huds., forma. On chalk. Rough, open ground in a clearing on Cranborne Chase, N. Dorset, alt. 600 feet, July 1922. —J. C. Melvill. " The leaves seem to me to be too broad for an *erectum* form. I doubt its being more than a form of the polymorphous *Mollugo*."—Druce. " Yes; leaf-veins not translucent." —Riddelsdell.

Valerianella dentata Poll. [10.]. Cultivated ground, near Hanley Swan, Worcester, v.-c. 37, September 5, 1922.—T. J. Wall.

Erigeron acris L. Headington, Oxon, September 1922.—G. C. Druce. Also from Spurn Head, East Yorks, v.-c. 61, September 9, 1922.—C. Waterfall.

E. canadensis L. Railway embankment near Llandough, near Cardiff, v.-c. 41, September 1922.—A. E. Wade.

Filago spathulata Presl. Cothill, Berks, October 1922.—G. C. Druce.

F. apiculata G. E. Smith. Berechurch, N. Essex, September 1922.—G. C. Druce.

F. germanica Huds., forma. Silver Wood, Weston, September 1922.—G. C. Druce.

F. gallica L. Berechurch, N. Essex, September 1922.—G. C. Druce.

F. ————? Godalming, v.-c. 17, July 8, 1922. I suppose only *germanica*, but it did not look like it in the living state.—H. J. Riddelsdell.

Inula salicina L. Origin : Lough Deargh ; cult. Watton, v.-c. 28, August 4, 1922.—F. Robinson.

Ambrosia artemisifolia L. St Anne's-on-Sea, W. Lancs, September 15, 1906. Coll. C. Bailey ; comm. G. C. Druce.

Guizotia abyssinica Cass. Garden weed, Colchester, v.-c. 19, October 26, 1921. Coll. J. C. Hunwicke ; comm. G. C. Brown.

"Correctly named."—Druce. "Yes; a Central African plant, cultivated for the production of Ramtilla oil."—Lester-Garland.

Galinsoga parviflora Cav. Weed in cultivated ground, Putney, August 1922. Came up abundantly in my garden this year as a weed. Two years ago I came across one or two small plants in a hedgerow more than a mile from my house, but I have seen none since until the sudden and abundant crop in my garden."—H. E. Fox. "Seems to be spreading in the London district. I have seen it recently in Oxford and Cambridge Terrace and in a deserted garden at Chelsea."—Lester-Garland.

Anthemis tinctoria L. Hanslope, Bucks, July 1922.—G. C. Druce.

Cotula coronopifolia L. In a ditch on a road running east of the Lighthouse, Wirral, N. Cheshire, November 4, 1901. Coll. C. Bailey; comm. G. C. Druce.

Artemisia maritima L., var. *gallica* (Willd.). Stony bank, Welwick salt marsh, near Patrington, E. Yorks, v.-c. 61, September 9, 1922.—C. Waterfall.

A. gnaphalodes Nutt. Waste ground, Radyr, v.-c. 41, September 1922. All the specimens came from one plant which was growing on a railway bank. How this plant could be taken for a variety of *A. Absinthium* L. (*Rep. B.E.C.* 564, 1921), I cannot imagine. Its habit is quite different (the stems are prostrate for two-third of their length), and the flowers are *brown*, even darker than those of *A. vulgaris*.—R. L. Smith. "Yes; the American alien."—Druce. "Ranked by Asa Gray as a variety of *A. Ludoviciana* Nutt. Its affinity is with *vulgaris* rather than *Absinthium*."—Lester-Garland. "Yes."—Thellung.

Petasites fragrans Presl. Roadside, Grangetown, Cardiff, v.-c. 41, December 1921.—A. E. Wade.

Senecio squalidus L. [1431.]. Exmouth, Devon, under walls, sides of the railway, near the docks, and in the street, May 29, 1922.—W. S. M. D'Urban. Also forma *grandiflora*. [Z 763.]. Botley, Oxon, July 1922.—G. C. Druce. "Two very different looking forms of this variable plant."—Lester-Garland.

S. erectus Trow. Garden, Bootle, S. Lancs, v.-c. 59, July 1, 1922.—J. A. Wheldon. Also var. *latifolius* Trow. Garden weed, Orrell, Liverpool, v.-c. 59, July 7, 1922.—J. A. Wheldon.

Carlina vulgaris L. Moorland bank of stream, Fossgill, near Newbiggin, Upper Yaredale, N.-W. Yorks, v.-c. 65, August 7, 1922. —C. WATERFALL.

Centaurea Jacea L., sub-sp. *jungens* Gugler, var. *variisquama* Gugler. [2577.]. Hort. West Barnes, Merton; origin, Byfleet, Surrey, August 1, 1922.—C. E. BRITTON.

C. Jacea L., sub-sp. *angustifolia* Gugler. [2269.]. Hort. West Barnes, Merton; origin, Epsom Downs, August 8, 1922.—C. E. BRITTON.

C. pratensis Thuill. [2578.]. West Barnes, Merton; origin, Woldingham, Surrey, June 23, 1922.—C. E. BRITTON.

C. Drucei C. E. Britton. [2393, 2443, 2444 and 2475.]. Epsom Downs, Surrey, September 12, 1922.—C. E. BRITTON.

C. surrejana C. E. Britton. [2553.]. Lower Morden, Surrey, October 18, 1922.—C. E. BRITTON.

C. nigra L. (1.) Yarnton, Oxon [Z 826 and Z 954.].—G. C. DRUCE. (2.) Wolvercote, Oxon [Z 89.].—G. C. DRUCE. (3.) Princes Risborough, Bucks [Z 997.].—G. C. DRUCE. (4 and 5.) Chalk Down, Pegsdon, Beds, and chalk pit near High Down, Herts. —J. E. LITTLE. "Judging by the examples that have reached me all the above are *C. nemoralis* Jord., radiant or not, and come under var. *subintegra*."—BRITTON.

C. nigra L. [Z 997.]. Mongewell, Oxon, July 1922.—G. C. DRUCE. "Probably only *C. nemoralis* Jord., but further material desirable."—BRITTON.

C. nigra L. [Z 1011 and Z 1012.]. Twinstead, N. Essex, September 1922.—G. C. DRUCE. "Both come under *C. Drucei*, but are not characteristic."—BRITTON.

C. obscura Jord. Leasowe, Cheshire, v.-c. 58, July 10, 1922. All collected within a small area in one field, but showing some variability in branching, size of calathia and breadth of leaves. All belonging to the same sub-species and flowering at the same time. —J. A. WHELDON. "Two sheets. One is *C. nemoralis* Jord., in which opinion Mr C. C. Lacaita joins. The other sheet is *C. obscura* Jord."—BRITTON.

C. Scabiosa L. [Z 830.]. Bullingdon, Oxford, July 1922.— G. C. DRUCE. "I place plants like this, with the phyllaries closely invested with a dense, white, arachnoid tomentum, to f. *cretacea* Wörlein."—BRITTON.

Lapsana communis L. (glandular). Highwood Lane, Patchway, W. Gloster, June 23, 1922.—Miss IDA M. ROPER. "The var. *glandulosa* Freyn Fl. Sud-Istr. p. 125. I have it from Aberdour, Fife; Ullapool, W. Ross; Oxford; Welwyn, Herts; Northampton, etc. It has long, stipitate glands on the peduncles. In the var. *pubescens* Koch also the plant is pubescent and glandular."—DRUCE. "Sub-var. *glandulosa* Freyn (pro var.) Fl. Sud-Istr. p. 125."—WADE. "This would seem to be the var. *pubescens* Hornem."—BROWN.

Hieracium amplexicaule L. Magdalen College, Oxford, June 1922.—G. C. DRUCE. "Yes; mine is a very fine specimen."—CRYER.

H. murorum L., forma. On debris of disused quarries on the Great Doward, opposite Symond's Yat, S. Hereford, June 7, 1895. Coll. C. BAILEY; comm. G. C. DRUCE. "A robust specimen of *H. serratifrons* Almq., var. *lepistoides* Johanss."—CRYER.

H. pellucidum Laestad. Miller's Dale, Derby, June 1922.—F. ROBINSON. "I think correctly named (= *H. pellucidum*, var. *lucidulum* Ley in Journ. Bot. 3, 1900). I have collected exactly the same plant at Matlock and in Wharfedale."—PUGSLEY.

H. holophyllum W. R. Linton. Great Orme's Head, v.-c. 49, May 27, 1920.—J. CRYER. "The sheet sent shows two plants of *H. holophyllum* with leaves much thinner and more markedly denticulate than those usually seen on the Great Orme. They probably grew in a sheltered or shaded position."—PUGSLEY.

H. sarcophyllum Stenstr., var. *expallidiforme* Dahlst. Heseldon Gill, v.-c. 64, July 23, 1922.—J. CRYER.

H. vulgatum Fr. (agg.). [1948.]. Sandy bank near Bentley, E. Suffolk, v.-c. 25, August 6, 1922.—G. C. BROWN. "One specimen on my sheet without a flower appears to me to be *H. mutabile* Ley. The other is a scrap and is unrecognisable."—J. CRYER. "Is a form of *H. sciaphilum* Uechtr."—PUGSLEY.

H. scanicum Dahlst. Carboniferous limestone at Ingleton, v.-c. 64, June 23, 1922.—J. CRYER. "The sheet sent shows one small plant, with three flowerheads, which no doubt belongs to the form that now passes as British *H. scanicum*. Its leaves are very little cut—merely denticulate except the two upper cauline—and very different from those of vigorous examples, where the lower foliage may be strongly toothed and the upper almost pinnatifid. Ley remarks on this species in *Journ. Bot.* xlvii., 49, 1909, ' British specimens . . . differ from Dahlstedt's Exsiccata . . . by having the panicle-branches rather longer . . . the phyllaries more abundantly clothed with longer glandular hair, and by livescent style . . . British plants differ a good deal in the amount and depth of leaf-toothing, but little if at all in the clothing of the phyllaries. Large plants have often a panicle subumbellate at the top.' This subumbellate panicle seems to me a common feature in robust and slender forms of our *H. scanicum.* The plant sent by Mr Cryer to the Club in 1920 as *H. Adlerzii* Almq. from Menai Bridge I now think is a robust form of *H. scanicum.* Last summer I collected there a totally different plant which I believe to be true *H. Adlerzii* (vide *Journ. Bot.* lxi., 21, 1923."—PUGSLEY.

H. umbellatum L. [528.]. Shady hedgebanks, Catfield, Norfolk, September 12, 1922. When gathered the lower flowering branches were standing out nearly at right angles to the stem. Many plants 5 feet high.—F. ROBINSON. " Is not this the var. *coronopifolium*?"—DRUCE. " A form, with livid styles, approaching var. *paniculatum* Cariot, as described in W. R. Linton's *British Hieracia.*"—PUGSLEY.

Hypochaeris glabra L. Amongst short grass, Kilnsea Warren, Spurn Head, E. Yorks, v.-c. 61, September 9, 1922.—C. WATERFALL. " Yes ; the type."—DRUCE.

Taraxacum lacistophyllum Dahlst. [1942.]. Sea-wall by R. Colne, Colchester, v.-c. 19, April 20, 1922.—G. C. BROWN. Also [1941.] from sandy shore, E. Mersea, N. Essex, v.-c. 19, May 14, 1922.—G. C. BROWN. Both determinations confirmed by Dahlstedt.

T. erythrospermum Andrz. Windmill Hill, Hitchin, Herts, v.-c. 20, May 16, 1922.—J. E. LITTLE. *T. laciniatum* Dahlst., fide DAHLSTEDT.

T. erythrospermum Andrz. Cricket field, Hitchin, Herts, v.-c. 20, June 2, 1922.—J. E. LITTLE. *T. brachyglossum*, fide DAHLSTEDT.

T. ———— ? Sect. *Palustria.* [1939.]. Grassy shore and banks, E. Mersea, N. Essex, v.-c. 19, May 14, 1922.—G. C. BROWN.

Lactuca Serriola L. By the railway near Penrhyndeudreath, Merioneth, v.-c. 48, September 8, 1922.—W. C. BARTON. " Yes ; a N.C.R. for Merioneth, but probably adventive."—DRUCE.

L. ———— ? [1949.]. Waste ground by maltings, Hythe Quay, Colchester, N. Essex, July 1922. I can find no description which fits this better than that of *L. quercina* L. in Archangeli's *Flora Italiana.*—G. C. BROWN. "Why not *L. Scariola*? The leaves of *L. quercina* in Herb. Brit. Mus. are much more cut."—LESTER-GARLAND.

L. macrophylla. [362.]. Kingsland, Shrewsbury, July 16, 1922.—Miss A. WILKINSON. "The history of this name is as follows:—It starts with *Mulgedium macrophyllum* DC. Prod. vii., 248, 1838, which De Candolle says = *Sonchus macrophyllus* Willd., and which he says in error comes from N. America, where the plant apparently was in cultivation. Asa Gray, *Syn. Fl. N. Amer.* i., 11, 444, 1884, mentions casually *Lactuca macrophylla*, which he says = *Sonchus macrophyllus* Willd., and which he distinctly says is *not* known from N. America, but is probably of European origin. Bailey, *Cyclopædia of Horticulture*, 2075, 1919, adopts De Candolle's name, but adds 'said by the older botanists to come from N. America but probably European.' Meanwhile Boissier, *Fl. Orient.*, iii., 799, 1875, identified it with a Caucasian species.—'*Mulgedium grande* C. Koch. Linn. xvii., 279, 1843, e Caucaso omnino identicum cum *M. macrophyllo*, planta ex hortis botanicis tantum nota et neutiquam in America Boreali obvia.' The correct name is therefore *Mulgedium macrophyllum* (Willd.) DC., or *Lactuca macrophylla* (Willd.) A. Gray, if it is transferred to that genus."—LESTER-GARLAND. "Yes; a beautiful Caucasian species, which has also been sent me from Cumberland (see *Report* p. 613.)"—DRUCE.

Mulgedium alpinum Less. Romsdal, Norway, August 9, 1922.—R. J. BURDON.

Calluna vulgaris Hull, var. *incana* Reichb. [2129.]. Ha Wick, Waas, Hoy, Orkney, September 11, 1922.—H. H. JOHNSTON. "Yes; beautifully prepared specimens, but the earliest name for the variety is var. *pubescens* Hull."—DRUCE.

Erica ciliaris L. Dry heath near Corfe, Dorset, v.-c. 9, August 1907.—L. CUMMING.

Menziesia caerulea Sw. Stjaerkin, Dovre, and Groblid, Norway, August 2 and 14, 1922.—R. J. BURDON.

Daboecia cantabrica Koch. Barna, Co. Galway, Ireland, July 23, 1922.—D. J. EVANS. Also, sub nomine *Menziesia polifolia* Juss., from the shores of the Killary Harbour, N.-W. Galway, October 5, 1885. Coll. C. BAILEY; comm. G. C. DRUCE.

Limonium vulgare Mill. Salt marsh, Welwick, near Patrington, E. Yorks, v.-c. 61, September 9, 1922.—C. Waterfall. "Yes; *Statice Limonium.* Rare evidently in v.-c. 61, and I had not previously seen a specimen from that v.-c. It is given, however, for two or three stations in Robinson's *Flora*, 1902."—Salmon.

L. vulgare Mill., var. *pyramidale* (Syme) Druce. Near Conway, Carnarvon, July 1919.—G. C. Druce. "*Statice Limonium* L., forma *pyramidalis* C. E. Salmon in Journ. Bot. 92, 1913."—Salmon.

Statice binervosa G. E. Smith. Coast near Southwell, Portland, Dorset, August 21, 1911. This form has been gathered in the past for *S. recurvum*, but in spite of the somewhat outwards-arching spikes it cannot go under that. The scape is too slender, the leaves too large and broad, the exterior bracts no not overlap and their proportion to the inner one is wrong for that plant.—C. E. Salmon.

Phacelia tanacetifolia Benth. Horsepath, Oxon, June 1922.—G. C. Druce.

Symphytum peregrinum Ledeb. [1458.]. Exmouth, Devon, side of road behind the Cottage Hospital, June 19, 1922.—W. S. M. D'Urban.

Benthamia lycopsioides Lindl. Hythe Quay, Colchester, v.-c. 19, May 18, 1922. Small seedling plants in immense quantity on malting refuse. There is a considerable variation in the size of the flowers.—G. C. Brown. "Cf. *Menziesii* (Lehm.) N. & M."—Thellung.

Myosotis dissitiflora Baker. [1505.]. Newport, Countess Wear, near Exeter, quite naturalised, May 20, 1922.—W. S. M. D'Urban. "This name was given by J. G. Baker in *Gardeners' Chronicle* p. 599, 1868, to a plant said to have been brought from Switzerland."—Lester-Garland.

M. versicolor Sm. [1778.]. Hay field near Greentofts, Deerness, Mainland, Orkney, June 23, 1922. Not native; a weed of cultivation. Stem clothed with spreading hairs; corolla minute, with a whitish limb when first expanded, but finally turning blue with a yellow throat.—H. H. Johnston. "Yes; I thought it might be native in the Shetlands and Orkneys when I saw it in Unst on pasture ground. It is admitted as such in the Swedish and Norge Floras, and it occurs in the Faroes."—Druce. "This seems to be the sub-var. *dubia* R. & F. Corolle blanche, devenant bleue. Rouy Fl. France x., 327."—Wade. Also from Polperro, v.-c. 2, in thin grass, May 1922. Style nearly as long as calyx, corolla tube long, but calyx more or less open, nutlets brown. Flowers cream or white, whole plant pale.—F. RILSTONE. "I should call this var. *pallida* Bréb. The open or closed state of the fruiting calyx is a variable character."—WADE. "Var. *pallida* Bréb."—BROWN. "This form is frequent in Jersey."—LESTER-GARLAND.

Lithospermum arvense L. Wheat field, Cranwich, v.-c. 28, June 1922.—F. ROBINSON.

Echium plantagineum L. West Mount, St Helier's, Jersey, June 1922.—L. CUMMING.

Verbascum virgatum Stokes. Railway bank near Cardiff, v.-c. 41, August 1922. I know half a dozen localities for this plant near Cardiff—all on railway banks, and it is yearly increasing its range. All our Cardiff plants are of one type, and no doubt will one day receive a varietal name. Pedicels always one-flowered, height 2 ft. 6 in., flowers of a peculiar washed-out greenish colour. Though the plants are cut down to the ground every midsummer they spring up again directly and by September are ripening their fruit.—R. L. SMITH. "Yes."—DRUCE. "Probably."—THELLUNG.

Linaria repens Mill. Railway embankment near Llandough, near Cardiff, v.-c. 41, September 1922.—A. E. WADE. "Yes."—DRUCE.

L. repens × *vulgaris*. Railway embankment near Llandough, Cardiff, v.-c. 41, September 1922.—A. E. WADE. Also from the same locality from R. L. SMITH, who writes:—"This interesting hybrid is increasing in this district. It invariably grows in close proximity to *L. repens*. This rather points to the conclusion that *L. vulgaris* must be its male parent. I also noticed plants which appeared to be more like *repens* than *vulgaris*, but never any vice versa. This hybrid produces plenty of seed, but whether it is abortive or not I am hoping to find out next season." "Yes."—DRUCE.

Scrophularia ramosissima Lois. Waste ground, Radyr, v.-c. 41, July 1922. All these specimens were obtained from one plant (since destroyed). It had a tap root, quite six feet long, embedded in loose sand. Origin: ship's ballast.—R. L. SMITH. "Correct, I believe. Distinguished from *S. canina* L., of which it is hardly more than a variety, by the smaller flowers and simpler panicle. The exuberant growth of many aliens on ballast or in waste places is a notable fact. It is probably due in the first case to the presence of an abundant supply of various plant foods in the soil, and in the second to absence of competition."—LESTER-GARLAND. "Is *S. canina* L., forma."—THELLUNG.

Euphrasia hirtella Jord., var. *brevipila* Rouy. Langness, Isle of Man, v.-c. 71, September 12, 1922.—J. A. Wheldon. "I should call this *E. brevipila*."—Pearsall. "These specimens possess in varying degree the shortly-stalked foliar glands characteristic of *E. brevipila* Burn. & Grem., and I think must be so named. They show also a number of short setae or bristles, which we do not usually see, I think, in British material of this species. The specimens appear small-flowered for *E. brevipila*, and resemble some of those occurring in the south of England rather than the form prevalent in Scotland. I do not agree in reducing *E. brevipila* to a variety of *E. hirtella* Jordan."—Pugsley.

E. occidentalis Wettst. Waste ground, Perranporth, v.-c. 1, July 1922.—F. Rilstone. "Mr D. Lumb refers these to *E. septentrionalis*, with much smaller foliage in some instances than in Druce's original gathering."—Pearsall. "I do not think this plant a form of *E. occidentalis* owing to the acute and aristate teeth of the floral leaves, their abundant glandular as well as simple hairs, and the smaller and narrower capsules. The specimens recall in most respects those sent to the Club from County Down by Mr Waddell in 1918, and referred to *E. brevipila*, but they differ distinctly in their much more abundant, simple, and glandular hair-clothing. On the whole I think the form best referred to *E. brevipila*, although this is usually less hirsute and clothed with more shortly stalked and uniform glandular hairs. In Scottish examples, however, I have occasionally seen almost precisely the hair clothing of these specimens."—Pugsley.

E. ————? Bettyhill, Sutherland, July 1920.—G. C. Druce. "*E. septentrionalis*, taller than any in Druce's Caithness gathering, teste D. Lumb."—Pearsall. "This is a mixture. Some of the plants, with abundant, shortly-stalked, foliar glands, are the large Scottish form of *E. brevipila*. Others, almost eglandular, but with numerous stout, whitish setae, are, I think, *E. latifolia* Pursh."—Pugsley.

E. scotica Wettst. Boggy ground near springs, on ascent from Carding Mill Valley, Church Stretton, Salop. A dwarf form. August 1922.—J. C. Melvill. "Many of the leaves on these plants are similar to those of *E. salisburgensis*; but such leaves are frequently found, although much fewer in number, on *E. Kerneri*, to which species these plants belong."—Pearsall. "It is perhaps rather dangerous to name definitely these very dwarf examples of *Euphrasia*, but I suspect from the flexuous habit, narrow, glabrate leaves and broad capsules that they are a starved state of my *E. confusa*, f. *albida*."—Pugsley.

E. salisburgensis Funck. On limestone, Cooloch, Co. Galway, Ireland, July 24 and August 9, 1922.—D. J. EVANS. "Yes; nice characteristic plants."—DRUCE. "My sheet only consists of one plant, but it is one of the best examples of *E. salisburgensis* I have yet seen."—PEARSALL. "One of the most distinct of our British forms of *Euphrasia*. On the continent it appears to be chiefly an alpine or sub-alpine plant. Cf. Townsend in *Journ. Bot.* 441, 1896 (with plate) and 196, 1897.—LESTER-GARLAND.

Rhinanthus stenophyllus Schur. [1879.]. Point of Onston, Stenness, Mainland, Orkney.—H. H. JOHNSTON. "This is, I believe, the plant usually referred to *R. monticola* by British botanists, but whether it is the same as Chabert's and Sterneck's plant remains to be proved. It seems very close to a small state of *R. stenophyllus*." —SALMON. "If the determination is right the citation should stand as *R. minor* Ehrh., var. *stenophyllus* Schur (1866). Townsend (*Journ. Bot.* 295, 1903) says that the plant is the same as the var. *angustifolius* Fr. (1843) and the var. *angustifolius* Koch (1844), but this name is not available as Gaudin described quite a different plant as *R. angustifolius* in 1806."—LESTER-GARLAND.

Melampyrum pratense L., var. *ericetorum* Oliver. Moorlands, ascent of Hope Mountain, near Caergwyrle, Flintshire, v.-c. 51, July 22, 1922.—C. WATERFALL.

Mentha alopecuroides Hull. Little Maplestead, N. Essex, September 1922.—G. C. DRUCE. "Yes; characteristic in scent and other details."—SALMON.

× *M. piperita* L., forma. Brailes, N. Wilts. Coll. C. P. Hurst; comm. G. C. DRUCE. See *Report*, p. 742. This has rather shorter spikes than usual, but otherwise seems just *M. piperita*, *officinalis* Sole = *M. officinalis* Hull."—SALMON.

Salvia ————? Riddy Lane, Hitchin, v.-c. 20, July 3, and September 2, 1922.—J. E. LITTLE. "*Salvia Horminum* L., forma. The terminal bracts are generally deep blue, but there are specimens in Herb. Kew in which they are white and others in which they are pink. The leaves also are variable, particularly in the length of the petiole."—LESTER-GARLAND. "*S. Horminium*."—THELLUNG.

Thymus ovatus Mill., var. *subciliatus* Beck. Rocky pasture, Tickenham Hill, N. Somerset, v.-c. 6, September 1, 1922.—Miss IDA M. ROPER.

Calamintha montana Lam., var. *Briggsii* Druce. Roadside, Staunton, Forest of Dean, W. Gloster, v.-c. 34, August 18, 1922.—

Miss IDA M. ROPER. "Not this variety or species. It is surely *C. Nepeta* Clairv.—SALMON.

Nepeta hederacea Trév., var. *genuina* Gren. & Godr., approaching f. *magna* Mérat. [Ref. No. 1936.]. Ditch, Birchanger, N. Essex, v.-c. 19, June 4, 1922.—G. C. BROWN.

Galeopsis Tetrahit L. [589.]. Roadside, Maentwrog, Merioneth, v.-c. 48, September 7, 1922. The plants on the bank above were the coarser var. *nigricans*, of which a few [589 B.] were growing in one group of [589.]. Plant softer; leaves lighter green, more narrowed to the base and entire below, less rigid; stem and calyx with more and softer hairs; calyx spines shorter. A few specimens [598] of the common woodland form (var. *nigricans*) are sent for comparison. This has usually purplish flowers, but the white-flowered form is not infrequent.—W. C. BARTON. "The var. *nigricans* is an abundant plant in native situations in Merioneth and Carnarvonshire, but there are at least two other forms which require attention."—DRUCE. "Brébisson (*Fl. Norm.* ed. 5, 301) makes no mention of colour of flowers in his variety; he merely states that the calyx is blackish, with very long teeth. I see that in Mr Barton's No. 589 (type) their length is circa 5 mm., in his 589 B. (variety) they are circa 7 mm. The calyx colouring of *nigricans* is often much more pronounced than is shown in the specimen which reached me."—SALMON.

Leonurus Cardiaca L., var. *hirsutus* Hornem. Portishead Dock, N. Somerset, v.-c. 6, July 11, 1922.—Miss IDA M. ROPER. "Yes; correctly named as the var. *hirsuta*."—DRUCE.

Lamium maculatum L. Eastbourne, Sussex, May 18, 1922.—R. J. BURDON.

Littorella uniflora Aschers. By the Yeo Reservoir, Blagdon, N. Somerset, v.-c. 6, June 21, 1922. The plant carpeted in places the muddy slopes of Blagdon Lake, which was pasture land about 15 years ago. Otherwise very rare in the district.—Miss IDA M. ROPER.

Scleranthus perennis L. Norheimsund, Norway, August 1922.—G. C. DRUCE.

Amaranthus chlorostachys Willd. [530.]. Garden weed, Watton, September 1922.—F. ROBINSON. "Many authors put this under *retroflexus* L."—LESTER-GARLAND.

Chenopodium rubrum L., var. *pseudo-botryoides* Wats. Pond, Heyshott Green, Sussex, October 2, 1919.—C. E. SALMON.

C. murale L. Wells, W. Norfolk, v.-c. 28. August 22, 1922.—J. E. LITTLE.

C. striatum Kras. Botley, Oxon, September 1922.—G. C. DRUCE. "According to the Secretary's Report for last year (p. 305) *C. striatum* has very obtuse leaves like those of *C. ficifolium*, but in this plant they are very acute and quite differently shaped. I think this plant is what has hitherto been named *C. album*, v. *paganum* Reichb."—PUGSLEY.

C. carinatum R. Br. Waste ground, Bradford, v.-c. 64, June 23, 1918, teste Dr Thellung.—J. CRYER. "Yes; the Australian casual."—DRUCE. "Yes; = *Blitum glandulosum* Moq. The glands on the leaves become much more conspicuous when the plant is older."—LESTER-GARLAND.

C. glaucum L. Waste ground near Crouch House, Edenbridge, W. Kent, September 16, 1919. Evidently a rare plant in Kent. In Marshall's *Flora of Kent* only four stations are given, and it is stated that it is probably extinct in three of these.—C. E. SALMON.

C. ambrosioides L. St Philip's Marsh, Bristol, v.-c. 34, October 12, 1922.—Miss IDA M. ROPER. *C. chilense* Schrad., teste Dr Murr.

Salicornia ramosissima Woods. Mud flats, Berrow, N. Somerset, October 4, 1921. Coll. C. BUCKNALL; comm. J. W. WHITE.

Phytolacca decandra L. Waste ground, Bradford, v.-c. 64, September 24, 1917, in abundance.—J. CRYER. "Yes: the American Poke-weed."—DRUCE. "Yes."—THELLUNG.

Polygonum maculatum Trim. & Dyer. Botley, Oxon, September 1922.—G. C. DRUCE.

Rumex obtusifolius L., fruits. Wells, W. Norfolk, v.-c. 28, August 30, 1922. Coll. Miss W. LOMAS; comm. J. E. LITTLE. "*Rumex Friesii* Gren. & Godr. One principal tubercle (but often a second and third rather smaller); one fruiting segment larger than the others."—LITTLE.

R. maritimus L., fruits. Holkham Lake, W. Norfolk, v.-c. 28, August 21, 1922.—J. E. LITTLE.

Thesium humifusum DC. Near White Down, Surrey, July 22, 1922.—W. BIDDISCOMBE.

Euphorbia platyphyllos L. Garden weed, Oxford, July 1922.—G. C. DRUCE.

E. virgata W. & K. Waste ground, Barry, v.-c. 41, July 1922. —R. L. Smith. "Yes."—Druce and Thellung.

E. Cyparissias L. Exmouth, Devon, on sand hill above the Maer Golf Links, one patch, May 29, 1922.—W. S. M. D'Urban. "Yes; I have no record of it before for S. Devon."—Druce.

E. Lathyrus L. Weed in cultivated ground, Ilminster, Somerset, v.-c. 5, July 1922.—H. Downes.

Ulmus sativa Mill., var. *stricta* (Lindl.). [1405 and 1507.]. Newport, Countess Wear, near Exeter, March 13 and June 1, 1922. This year no samaras were produced, the season being very unpropitious. Fruits gathered in former seasons were small, and had the seeds close to the notch. The bud-scales are not ciliated.—W. S. M. D'Urban. Also from Polperro, v.-c. 2, November 3, 1922. —F. Rilstone. "Yes; the Cornish Elm, which seems to be a late flowerer. Notwithstanding the excellent accounts of the Elms which have been given in Elwes & Henry's *British Trees* and in the *Cambridge Flora*, the nomenclature is still not without difficulties—especially when, in the case of the most critical trees, these authors take different views of some of Miller's species. Miller himself had not very clear ideas, but tried to fit Goodyer's descriptions to his names and sometimes added contradictory synonyms. At the same time it would be difficult to believe he was unacquainted with the Cornish Elm. I have little doubt that it is his *U. minor*. His description is 'foliis oblongo-ovatis glabris acuminatis duplicato-serratis. Elm with oblong, smooth, acute-pointed leaves, which are doubly sawed. The smooth, narrow-leaved Elm, by some called the Upright Elm. It grows in hedge-rows in several parts of England. The branches of this sort have a smooth greyish bark and grow erect. The leaves are narrower than those of the English Elm and are smoother. They are later in coming out in the spring than those, but continue longer in autumn. This has been called by some the Irish Elm.' The distinguishing feature in the description is the upright branches, which is inapplicable to *U. Plotii*; and the bark character is adopted by Lindley for his *stricta*. I wish members would go into this question. On present information I should write *U. minor* Mill. = *U. stricta* Lindley."—Druce.

Alnus incana DC. Folly Alder Swamp, Hitchin, Herts, v.-c. 20, August and September 1921. The reddish leaf-gall between the nerves on the lower pagina of the leaf is determined by Mr E. W. Swanton as *Eriophyes brevitarsus* Nal.—J. E. Little. "Yes; the leaves of these specimens are nearer to the Norwegian form. The first I saw suggested a trace of *glutinosa*—a not infrequent hybrid in Norway, but these may be safely left as *incana*."—Druce. "Yes;

the typical form (*vulgaris* Spach). Extends all round the cool and cold parts of the N. Hemisphere, but not native in Britain."—LESTER-GARLAND.

Carpinus Betulus L. [628, &c.]. Denham Golf Links, Bucks, v.-c. 24. July 1, 1922.—W. C. BARTON. "No. 645, leafy specimens are the type. The fruit of 646 B. belongs to var. *provincialis* Gren. & Godr."—DRUCE.

C. Betulus L., forma. Pebmarsh, N. Essex. September 1922.—G. C. DRUCE.

C. Betulus L., nov. var. [Z 1065.]. Princes Risborough, Bucks.—G. C. DRUCE.

C. Betulus. A new variety. Two British varieties of this species have been recognised by Dr Moss (*Camb. Brit. Flora*, ii., 1914, pp. 78-79), but the variation from type which they present (little more than a difference in leaf-size) is so small as to be almost negligible. I desire now to record a third British variety, which is more marked and, as it seems to me, better deserves recognition, namely :—Var. *parvifolia*.—Leaves very small (from 3-4 cm. long only) almost completely ovate, point scarcely obvious, edges minutely double-serrate; lobes of cupule with slightly-serrate edges. The type specimen, from the lower chalk slopes at Chinnor, Oxfordshire, collected by Mr G. Claridge Druce, May 1884, is now in Herb. Brit. Mus., presented by Mr Druce, who suggests the above very appropriate name. Mr Druce informs me that he has met with the same form on the lower chalk slopes at Princes Risborough and Loudwater, both in Buckinghamshire, though a few miles only from Chinnor. The form is confined in Britain, so far as I know, to this one district; but it bears an extremely close resemblance to the type specimen of the species, from Smöland, Sweden, in the Linnean Herbarium at Burlington House, this specimen being a spring-gathered shoot, bearing catkins.—MILLER-CHRISTY.

Salix alba L., var. *caerulea* Sm. Twinstead, N. Essex. September 1922.—G. C. DRUCE. "The young leaves of late growths are still rather silky but the rest are rapidly becoming sub-glabrous, as they should be in this variety."—FRASER. "Insufficient material, but my specimen seems nearer the type."—PEARSALL.

S. triandra L. Sarsden, v.-c. 23, May 20 and August 22, 1922. ♂ and ♀. Whether the determination is correct I cannot say, the foliage of the two gatherings differs so much in shape and colour that I hardly think it possible that we have only one form here.—H. J. RIDDELSDELL. "♂ Yes: this is *Salix triandra* L., forma *bicolor*, the leaves being glaucous beneath. ♀ This is a typical *S. triandra* L., and seems to be the forma *concolor* (leaves green on both sides), but there are no mature leaves to make certain."—Fraser. "♂ Yes. ♀ Sub-sp. *Hoffmanniana*."—Pearsall.

S. triandra L., var. *Hoffmanniana* (Sm.). ♂. Edge of swamp below Brook End, St. Ippolyts, Herts, v.-c. 20.—J. E. Little. "This is perfectly typical."—Fraser. "Yes; a male form."—Pearsall.

S. aurita × *cinerea*. ♂. *Stratiotes* pond, Ickleford, Herts, Hitchin, Herts, March 28 and July 23, 1922.—J. E. Little. "Yes; note serration of leaf; large development of stipules; undeveloped buds near base of flowering shoots; slender branches of much-branched twigs."—E. F. Linton. "I agree."—Pearsall. "I fail to see any *S. aurita* in this and think it is only *S. Caprea* L.'—Fraser.

S. aurita × *cinerea*. ♂. *Stratiotes* pond, Ickleford, Herts, April 10, and July 30, 1922. This bush, though very near *S. cinerea*, does not seem quite typical.—J. E. Little. "Yes." —Pearsall. "I regard this as a narrow-leaved form of *S. cinerea* L., one of the most variable of British willows. Many of the larger leaves are too acuminate for *S. aurita*, and I would expect *S. aurita* × *cinerea* (*lutescens*) to be more hairy."—Fraser. Also from Folly Alder Swamp, Hitchin, Herts, April 15 and June 25, 1922. "Why not *S. aurita* × *cinerea*? Note stipules and slender twigs."—E. F. Linton.—J. E. Little. "I agree."—Pearsall. "The long striations beneath the peel are most suggestive of the influence of *S. aurita*. The pale colour of the pubescence also points to that species, but the leaves are too young. August and September are better months for mature leaves. The long leaves, long male catkins, form of the buds and pubescent one-year-old twigs make this *S. cinerea* L."—Fraser.

Helleborine longifolia Rendle & Britten. Wells, W. Norfolk, v.-c. 28, August 21, 1922. Growing abundantly on land which, *fide* Dr F. Long, sixty-five years ago was tide-washed salt-marsh.—J. E. Little. "Yes; but the more correct and older name is *H. palustris* Schrank. The trivial *longifolia* had been already used by Fritsch in *Cephalanthera longifolia* (L.)."—Druce. Also, sub-nomine *Epipactis palustris* Crantz, from hollows between the sand-hills, Birkdale, Southport, W. Lancs, July 23, 1881. Coll. C. Bailey; comm. G. C. Druce. "This is what Graebner referred to var. *ericetorum*."—Druce.

Orchis incarnata L. (a). Markham Fen, W. Norfolk, v.-c. 28, June 20, 1922. (b). Foulden Common, W. Norfolk, June 16, 1922.

Flowers purple, flesh or cream-coloured; leaves broad or narrow, strict.—J. E. LITTLE & J. L. LUDDINGTON.

Habenaria viridis Br. Firle Beacon, Sussex, August 22, 1922. W. BIDDISCOMBE.

Crocus biflorus Mill. Old pasture land, near Bury St. Edmunds, Suffolk, February 18, 1922.—F. ROBINSON.

Romulea Columnae Seb. and Maur. The Warren, Dawlish, Devon, in short turf on sand on the Golf Links towards Exmouth, April 21, 1922.—W. S. M. D'URBAN.

Narcissus major Curt. Field near Coed-y-gores, Penylan, v.-c. 41, March 1922.—A. E. WADE.

Galanthus nivalis L. Hazel copse, Michaelstone-y-Vedw, Monmouth, v.-c. 35, February 1922.—A. E. WADE.

Leucojum vernum L. Stogumber, N. Somerset, March 1922.—G. C. DRUCE.

Polygonatum multiflorum All. Stelham, Sussex, May 18, 1922. —R. J. BURDON.

Allium Scorodoprasum L. Near the School House, Thoralby, Upper Yaredale, N.-W. Yorks, v.-c. 65, August 16, 1922.—C WATERFALL.

Ornithogalum umbellatum L. Newport, Countess Wear, near Exeter, May 22, 1922. Naturalised in shrubbery.—W. S. M. D'URBAN.

Gagea lutea Ker-Gawl. Copse near Malvern, Worcs. v.-c. 37, April 18, 1922.—T. J. WALL.

Juncus subnodulosus Schrank. Fruiting stems. Ippolyts Common, Herts, v.-c. 20, October 24, 1922.—J. E. LITTLE.

J. silvaticus Reichb. Fruiting stems. Ippolyts Common, Herts, October 24, 1922.—J. E. LITTLE.

J. tenuis Willd. Roadside, Maentwrog, Merioneth, v.-c. 48, September 13, 1922.—W. C. BARTON.

J. pygmaeus Rich. Lizard Downs, Cornwall, v.-c. 1, June 1922. —H. DOWNES.

Acorus Calamus L. Long established on the banks of the Exeter Canal, June 28, 1922.—W. S. M. D'URBAN. "Not given for Devon in *Top. Bot.*"—DRUCE.

Sagittaria heterophylla Pursh, var. *iscana* Hiern. [1450.]. In the Canal, Exeter, June 29, 1922.—W. S. M. D'URBAN. "Yes; *S. heterophylla* Pursh = *S. rigida* Pursh, which is the name adopted in Buchanau's Monograph of the Alismataceae in *Das Pflanzenreich* 1903. The type is native in Canada and the Northern United States. For the discovery of the plant in Britain, *cf.* Hiern's elaborate paper in *Journ. Bot.* 273-278, 1908 (with plate of his variety). The occurrence of two North American water plants—this plant and *Potamogeton foliosus* Raf. (see below) in close proximity at Exeter is very interesting. Still more interesting is the fact that each of them differs enough from the North American types to justify the establishment of a new variety in the opinion of Mr Hiern in the one case and of Mr Arthur Bennett in the other."—LESTER-GARLAND. "How did the two Exe plants get there? Exeter is 10 miles from the sea, and the old wooden trade is dead. I wonder whether Mr D'Urban can suggest anything? Of course there are corn-mills and tanneries at Exeter, but I think no timber trade. Seeds might be conveyed in timber if the timber is put into the water, as it often is."—BENNETT. "See *Rep. B.E.C.* 399, 1908, where I said that 'American logs had been brought up the river to Exeter,' and this probably was the means of introduction. American Wood Pulp was also used in the mills at Exeter."—DRUCE.

Butomus umbellatus L. Exeter, in the Canal, June 28, 1922.—W. S. M. D'URBAN.

Potamogeton polygonifolius Pourr., var. *genuina* E.B. On the margin of Llyn-an-âfon, south of Llanfairfechan, N.-E. Carnarvon, alt. 1600 ft., September 29, 1884. Coll. C. BAILEY; comm. G. C. DRUCE. "This was probably Syme's idea of the plant, but the type of Pourret (which I have) was a much smaller plant. But, like all Mr Bailey's specimens, it is a good one."—BENNETT.

P. Drucei Fryer. Abundant in the Avon at Bath, July and August, 1922. Since it was first noticed there in 1916 (*Journ. Bot.* 82, 1918), the plant has greatly increased, the patches of floating leaves being now conspicuous on the slowly moving surface of the river. Until this summer no trace of flower or fruit had been observed in the locality, but on raking out a quantity near the Midland Station at the end of August I found that about one stem in twenty had produced a small peduncle, 2-2½ in., bearing a tiny spike of abortive flowers. The Loddon plant, cultivated by Mr Fryer in Cambridgeshire, ultimately bore 4 in. peduncles with flower-spikes of the same length; and in view of distinct characters presented by the fruit and stolons, unlike those of any known pondweed, Mr Fryer (*Journ. Bot.* 524, 1899) abandoned the impression that this remarkable plant was a hybrid = *alpinus* × *natans* and ranked it as a good species. Mr Arthur Bennett, writing some years ago on another suspected hybrid, says "Fruit must be patiently waited for, that it will come may be fairly considered a safe suggestion. In one case, in the United States, fruit was procured thirty years after the species had been first discovered; and in the case of Smith's *P. lanceolatus* an interval of eighty years occurred before a ripe fruit was seen." We are thus encouraged to believe that sooner or later this Avon *P. Drucei*, which possibly travelled to Bath from the Loddon by way of the Thames and the Kennet and Avon Canal, will show us as good fruit as it did in cultivation.—JAMES W. WHITE. "Yes; quite the plant of the Loddon, and in its second known locality in the world."—DRUCE.

P. alpinus Balb., var. *obscurus* Asch. Leeds and Liverpool Canal, Shipley, v.-c. 64, August 4, 1922, in abundance.—J. CRYER. "Yes; this is the *P. obscurus* of De Candolle Fl. France, supp. 5, 311, 1805. I have seen specimens from Mr Cryer."—BENNETT. "The definition of a species is sufficiently difficult, but who will define a variety? Ascherson's var. *obscurus* includes all forms destitute of floating leaves, and is unnecessary."—PEARSALL.

P. nitens Weber, var. *sub-perfoliatus*, forma *fluminеus* Hagstr. Spiggie, Shetland, August 1921.—G. C. DRUCE. "I expect this was named by Dr Hagström, whose lamented death is a great loss to students of *Potamogeton*. If so, of course, comment is needless. But I should certainly not so name it. It bears no resemblance to his fig. 107. To me it comes under his *sub-gramineus*, fig. 106. Dr Tiselius first named the *sub-perfoliatus* as '*perfoliatiformis*' in his extra No. 41!, and I have numerous specimens named by him."—BENNETT. "Yes, according to Hagström."—PEARSALL.

P. flabellatus Bab. Pit between Moreton and Leasowe, near Birkenhead, N.-W. Cheshire, August 29, 1885. Coll. C. BAILEY; comm. G. C. DRUCE. Also from Derby, July 7, 1884, from the same collector, of which Mr Arthur Bennett writes, "I do not think it is possible to name *flabellatus* unless in fruit, or having the wide developed leaves. The fruiting (or rather flowering) state of this specimen is remarkably like *P. filiformis* Pers. in habit. It is *P. pectinatus* L., agg." A common form of *P. pectinatus* L.—W. H. PEARSALL.

P. [*pusillus* L.] In deep water near the Double Lock, Exeter Canal, August 18, 1921. [Ref. No. 1357.]—W. S. M. D'URBAN.

"This is an alien species, a native of North America, and the second species that has occurred as an introduction in England; the other being *P. pennsylvanicus* Cham. et Schlecht., found by Miss Vigurs in a canal near Halifax, Yorkshire (*Naturalist* 10, 1908). It is *P. foliosus* Rafinesque in Medical Repository, 2nd Hex. 5, 354, 1808 = *P. pauciflorus* Pursh Flora Amer. Sept. 1, 121, 1814. It is distributed from Hudson's Bay Territory to Florida, and from New York to California, and Colorado, the West Indies, and the Sandwich Isles. It occurs in 32 of the United States Territories, States, etc. It is a variable species, from a broad-leaved stout form, the var. *niagarensis* (Morong) = *P. niagarensis* Tuckerman in Amer. Jour. Science, 2 ser., vii., 354, 1849, to very narrow-leaved forms with few flowers in the Eastern States. Occurring as far north as 57 degs. N. Lat. It is possible it may have been introduced to the Sandwich Isles in drift wood from the United States of America (see Wallace *Island Life*, ed. 2, 320, 1892). These are the only two introductions of *Potamogeton* that I know of. Dr Morong in his Mon. N. Am. species in Mem. Torrey Bot. Club, iii., 37, 1893, under *P. crispus* L., calls it "introduced from Europe," but he omitted to note that Pursh in 1814 records it from "Canada to Virginia," and marks it "v.v.," having seen a living specimen. It certainly occurs in Arizona where Dr Morong suggests it might have been carried by birds. It is a curious fact that another American water plant, *Sagittaria heterophylla* Pursh, has been found in the River Exe in Devon. It is understandable with regard to the Yorkshire *Potamogeton* as it is abundant in the cotton-growing states of the U.S.A., and its seeds might get among the cotton. I have looked up my 51 specimens of *P. foliosus*, and the result is that while the U.S.A. specimens from East to West present different forms, yet the arrangement of the stems and branching is symmetrical, while in the Devon plant they are diffuse, with a greater number of fruits on the peduncles. So I think it may be well to separate the Devon plant as var. *diffusus* (nov. var.) characterised by the loose branching stems, longer internodes, longer peduncles and fruits developed in larger numbers on the peduncles, especially if it is challenged, which I hope it may be."—BENNETT.

Ruppia maritima L. (= *R. spiralis* Hartm.). Loch of Carness, St Ola, Mainland, Orkney, October 19, 1922.—H. H. JOHNSTON. "Yes; a fine-leaved form, excellently displayed."—PEARSALL. "This is surely *rostellata*. It has not the inflated sheaths, long, spirally-twisted peduncles and the less gibbous fruits of *spiralis*. All these are seen on specimens before me from Loch Stenness, Orkney, collected by F. C. Crawford in 1902."—SALMON.

Eleocharis uniglumis Schultes. Littlesea, Dorset, June 20, 1922.—C. E. SALMON.

Scirpus fluitans L. Tan-y-Bwlch Lake, Merioneth, October 7, 1922.—W. C. BARTON. "Yes; the floating state."—DRUCE.

Rhynchospora alba Vahl, var. Chobham Common, Surrey, August 22, 1922.—W. BIDDISCOMBE. "This looks like var. *sordida* of Syme, 'spikelets pale reddish-brown'; but this has now been dropped as of no real value."—SALMON. "I do not see any variety in this. The var. *sordida* has quite a different habit and colour."—BENNETT.

Kobresia caricina Willd. Stjaerkin, Dovre, Norway, August 3, 1922.—R. J. BURDON.

Carex Pseudo-cyperus L. Canal, Woking, July 22, 1922.—W. BIDDISCOMBE. "Correct. Nice specimens of this *Carex*."—BENNETT.

C. vesicaria L. Canal by Brinklow Station, Warwickshire, v.-c. 38, July 1922.—L. CUMMING. "This is towards var. *pendula* (Uechtr. herb.) Asch. & Graeb. Syn. Fl. Eur. 212, 1903."—BENNETT. "This is not true *C. vesicaria* L., but a hybrid of it with *C. riparia*, = *C. Csomadensis* Simonk. The fruits are too hard, dark and rough for true *vesicaria*, which in northern Britain readily hybridises with *C. inflata*. In the Midlands the above hybrid occurs in several places."—DRUCE. "Surely *C. riparia*." —SALMON.

C. lasiocarpa Ehrh. Grayrigg Tarn, Westmoreland, v.-c. 69, alt. 700 ft., peat formation, July 1922.—A. WILSON. "Yes; correct. The Swedish botanists seem to doubt whether this was the *filiformis* Linn. Sp. Pl., ed. 1, 1753 (2, p. 976). Ehrhart's name occurred in his Calam. Gram. etc., sec. 1-14, No. 19, 1785—a series of exsiccata in 6 parts, published from 1780 to 1793. Linnaeus says nothing about the hairy fruit, but quotes Scheuchzer 425, t. 10, f. 11, 1719. It wants looking up in Linn. herb. and the Hortus Cliffortianus."—BENNETT.

C. hirta L. [1430.]. Newport, Countess Wear, near Exeter, May 27, 1922.—W. S. M. D'URBAN. "Approaches var. *hirtiformis* Pers., but that is, with the exception of the perigynium, totally glabrous. The awns of the glumes in these specimens are scarcely long enough to bring them under var. *spinosa* Mort., I believe."—SALMON.

C. silvatica Huds. [1429.]. Newport, Countess Wear, near Exeter, May 20, 1922.—W. S. M. D'URBAN. "Yes; correct. Frequent in Devon, local in Cornwall."—BENNETT.

C. flava L., var. *minor* Towns. Marham Fen, W. Norfolk, v.-c. 13, June 20, 1922.—J. E. LITTLE. "Yes; the var. *oedocarpa* Anders., which is practically synonymous."—DRUCE. "I am not quite happy in calling this *C. Oederi*, var. *oedocarpa* And. (= *flava*, var. *minor* Towns.), but I do not know what else it can come under."—SALMON.

C. elata All. Edge of Hatchmere, Delamere Forest, Cheshire, v.-c. 58, May 27, 1922.—C. WATERFALL. "A small form of *C. stricta* Good., I suppose. It does grow there."—BENNETT. "Yes."—DRUCE and SALMON. "The name adopted by Kükenthal is *C. Hudsonii* A. Bennett, on the ground that *C. stricta* Good. is antedated by *C. stricta* Lam., a North American species, while *C. elata* All. is from the description equally applicable to *C. gracilis* Curt."—LESTER-GARLAND.

C. gracilis Curt. Bank of the Thames below Burford Bridge, Oxon, v.-c. 23, June 21, 1922.—C. WATERFALL.

C. Lachenalii Schkuhr. Grotli, Norway, August 1922.—G. C. DRUCE. Also from the same locality (sub-nomine *C. lagopina* Wahl.), August 14, 1922.—R. J. BURDON.

C. curta Good. Midhurst, W. Sussex, v.-c. 13, July 11, 1922.—J. E. LITTLE. "Yes; a station not given in the *Flora*. A rare species in Sussex."—BENNETT.

C. muricata L., forma. [529.]. High Tor, Derbyshire, June 1922.—F. ROBINSON. "I think a small form of *C. divulsa*, but the fruit is not ripe, and in its present state differs from the group."—BENNETT. "I wish the ligules had been better represented. From the inflorescence and the shape and size of the fruit I think this must go to *C. Leersii* F. Schultz, which I put as a var. of *muricata*."—DRUCE. "Gathered rather early, and ripe fruit would be valuable. Beak and ligule rather long for *C. Pairaei*, but I believe it comes under that. The interrupted spike reminds one of *Leersii*."—SALMON.

C. paniculata L., f. *simplicior*. Canal by Brinklow Station, Warwickshire, v.-c. 38, July 1922.—L. CUMMING. "Andersson's name *simplicior* dates from 1849, in Cyp. Scand. p. 67. But Gray, Nat. Arr. Brit. Plants 46, 1821, named it *simplex*."—BENNETT. "The panicle is too compound for the var. *simplex* Peterm."—DRUCE. "Yes; it seems to agree with Andersson's description of his *simplicior*."—SALMON.

C. ———? Canal by Brinklow Station, Warwickshire, v.-c. 38, July 1922.—L. CUMMING. "*C. acuta* L. (*C. gracilis* Curt.)."—

BENNETT. "This is an interesting form of *C. acuta*, which I should like to see with fruit a little riper. The ± regularly 8-rowed dense spikes recall *C. tricostata* Fries, but that has distant, erect spikes, shorter and oblong, and the fruit, as in *C. trinervis* Degl., with 3 raised ribs."—SALMON.

Echinochloa frumentacea Link. Waste ground, Bradford, v.-c. 64, October 22, 1921. First found in 1917, and so named by Dr Stapf, and confirmed by Dr Thellung.—J. CRYER. "Usually considered to be a form or cultivated race of *Panicum Crus-galli* L."—DRUCE. "Yes; = *Panicum frumentaceum* Roxb., cultivated in India for its fruits."—LESTER-GARLAND.

Spartina stricta Roth. Ray Island, N. Essex, September 1922. G. C. DRUCE.

Alopecurus pratensis L., var. *caesius* A. Schwartz. [2494 and 2496.]. West Barnes, Merton and North Cheam, v.-c. 17, June 8, 1922.—C. E. BRITTON. "This seems to be a good variety."—DRUCE.

Milium effusum L. By woodland stream, Abistock Woods, Cheshire, v.-c. 58, June 5, 1922.—C. WATERFALL.

Agrostis canina L., var. *pallida* Reichb. Shady roadside, Gollawater, near Perranporth, v.-c. 1, September 1922. A gathering from this station was so named at Kew by Dr Stapf in 1921.—F. RILSTONE.

A. canina L., forma. Bourne, Lincs, August 28, 1922.—A. WEBSTER.

Apera Spica-venti Beauv. Taplow, Bucks, July 5, 1922.—A. WEBSTER.

Ammophila baltica Link. Caistor-on-Sea, Norfolk, v.-c. 28, July 31, 1922.—F. ROBINSON.

Lagurus ovatus L. Sandy sea-shore, St Ouen's Pond, Jersey, June 2, 1922.—L. CUMMING.

Deschampsia alpina R. & S. Lochnagar, S. Aberdeen, July 1918.—G. C. DRUCE.

Avena fatua L., var. Riddy Lane, Hitchin, v.-c. 20, September 4, 1922. Appears to come very near *A. intermedia* (Lindg.) in Babington's *Manual*, "Lower pales nearly glabrous, becoming pale yellowish-olive."—J. E. LITTLE.

Cynodon Dactylon Pers. Foreshore at Penzance, Cornwall, v.-c. 1, September 1920.—H. DOWNES.

Cynosurus echinatus L. West Mount, St Helier's, Jersey, June 7, 1922.—L. CUMMING.

Koeleria gracilis Pers., var. *britannica* Domin. Sandy places, the Quenvais, Jersey, June 6, 1922.—L. CUMMING. "This should be compared with *K. albescens*."—DRUCE.

Poa bulbosa L. Near Pontac, Jersey. N.C.R. Coll. Lady DAVY, May 1922; comm. G. C. DRUCE. "An interesting find. Probably native. Corbière says that it is frequent in Normandy." —LESTER-GARLAND.

Glyceria fluitans Br. Maidencroft, Hitchin, Herts, v.-c. 20, July 1, 1922.—J. E. LITTLE.

Festuca Myuros L. Roadside under Clifton Down, Bristol, June 29, 1902.—JAS. W. WHITE.

Bromus rigens L. Ware, Herts, June 1922.—G. C. DRUCE. Also from Hythe Quay, Colchester, v.-c. 19, June 6, 1922.—G. C. BROWN.

B. secalinus L. [Z 830.]. Bullingdon, Oxon, July 1922.—G. C. DRUCE. Also from Jerring, Sussex, June 29, 1922.—R. J. BURDON. Of Preb. Burdon's plant Dr Druce says, "This appears to be the var. *badensis* (Gmel. Fl. Bad. iv., 74, t. 5). In var. *velutinus* the spikelets are larger and longer."

B. hordeaceus L., var. *glabratus* (Doell). Field border, Roath, Cardiff, v.-c. 41, June 1922.—A. E. WADE.

Brachypodium silvaticum Roem. & Schult., var. *glabrescens* Syme (fide Arthur Bennett). Grassy cliffs at the seashore, Berstane, St Ola, Mainland, Orkney, October 19, 1922. Confirms the record of this species from Berstane in Dr A. R. Duguid's MS. *Flora Orcadensis* 1858. See *Journ. Bot.* 17, 1864.—H. H. JOHNSTON. "Yes; the var. *glabrescens* Syme."—DRUCE.

Agropyron junceum Beauv. [1535.]. Exmouth, Devon, in sand at the base of the red marl cliffs, June 8, 1922.—W. S. M. D'URBAN.

A. violaceum (Hornem.). Hjerkin, Norway, July 1922.—G. C. DRUCE. "Assuming that Dr Druce has got the right plant—as to which I express no opinion—the name should stand as *Agropyron violaceum* C. Richt. Pl. Eur. i., 123, 1890. Hornemann (*Fl. Dan.* t. 2044) published his plant as *Triticum violaceum*. Koch (*Syn.* ed. 3, p. 716) reduced *T. violaceum* Hornem. to a variety of *T. biflorum* Brignoli (*T. biflorum* Brign., var. *Hornemanni* Koch), of which species he apparently regarded it as a northern form."—LESTER-GARLAND.

Elymus europaeus L. Steep banks on stream-side, Torn Ghyll, Thoralby, Upper Yaredale, N.-W. Yorks. v.-c. 65, August 16, 1922.—C. WATERFALL.

Equisetum pratense Ehrh. Bank of Tees, High Force, Teesdale, July 1, 1922.—F. ROBINSON.

Asplenium serpentini Tausch. Near Cabrach, N. Aberdeen, August 1918.—G. C. DRUCE.

Woodsia ilvensis Br. Romsdal, Norway, August 10, 1922.—R. J. BURDON.

W. alpina S. F. Gray. Vossevangen, Norway, August 27, 1922.—R. J. BURDON.

Hymenophyllum peltatum Desv. Rocks in Festiniog Valley, Merioneth, v.-c. 48, September 13, 1922.—W. C. BARTON.

Azolla filiculoides Lam. Reens, Goldcliff, Monmouth, v.-c. 35, June 1922.—R. L. SMITH.

Nitella intricata Braun. Yarnton, Oxon, May 1922.—G. C. DRUCE.

Chara fragilis Desv., var. *delicatula* von Leonh. In the mud at the edge of Lochan Dubh, one mile north of Oban, W. Argyll, July 25, 1885. Coll. C. BAILEY; comm. G. C. DRUCE.

C. canescens Lois. Small pond on Lizard Downs, v.-c. 1, June 1921.—H. DOWNES. Confirmed by Mr J. Groves.

C. fragifera Dur. Pool on Lizard Downs, v.-c. 1, June 1920.—H. DOWNES. Confirmed by Mr J. Groves.

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